THE INTERFACE OF MATERNAL AND CHILD PSYCHOLOGICAL AND PHYSICAL HEALTH: WHAT MATERNAL CHRONIC PAIN MEANS FOR CHILDREN'S FUNCTIONING.

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

A series of questions regarding the impact of maternal chronic pain on children were addressed in this dissertation. Firstly, the physical and psychosocial functioning of 39 mothers suffering from chronic pain was compared to 35 control healthy mothers in order to determine the extent to which mothers with chronic pain may be compromised and their children may be at risk. It was found that mothers with chronic pain had decreased physical, mental and social functioning, as well as reduced parenting efficacy. Secondly, the children of these mothers were compared on a range of physical and psychosocial health outcome measures. The 55 children in the maternal chronic pain group experienced maladjustment, as reported by children, mothers and fathers. This included reduced physical and mental heath compared to the 48 control children, as well as reduced attachment security and social skills. Thirdly, although a number of maternal psychosocial variables, such as maternal mental health were correlated with child functioning, only one variable- parenting- consistently emerged as a significant predictor of child problems. In particular, the warmth of the mother-child relationship, and the mother's use of over-reactive discipline strategies were significant mediators. The findings reflect that maternal chronic pain is a source of risk for many children. Consistent with much of the maternal chronic stressor literature, the mechanism of transmission from physical compromise in the mother to maladjustment in the child appears to largely involve dysfunctional parenting practices. The findings are discussed in terms of the cost of maternal chronic pain to children and society. In particular, intervention needs to be targeted at suffering mothers and their children. This will reduce the deleterious consequences for children and the potential demands of a new generation of sufferers on the public health system.

CHAPTER 1

INTRODUCTION

Discomfort, aching, tenderness, and soreness are but some of the unpleasant guises of pain and are all too familiar at times of illness or physical impairment. Backache, headache and neural pain are common maladies that affect most people at some point in their lives. The pain can be so disturbing that the individual craves relief or escape. For most people, this acute pain eventually subsides until the experience of pain becomes such a distant memory that it is difficult to recall. For some, however, such pain is relentless, indefinite and a constant reminder of its presence. Such sufferers of *chronic* pain may be limited in their recollection of function before pain. For many people afflicted by chronic pain, physical and emotional discomfort is present on a daily basis, and quality of life is often limited. Sufferers may have difficulty engaging in basic activities such as work and self-care (Horn & Munafo, 1997). In this sense, chronic pain may be viewed as the very antithesis of well-being.

This does not mean that all people who experience chronic pain live in a compromised state. On the contrary, many sufferers of chronic pain manage to lead relatively functional and productive lives. A multiplicity of processes must be at work in the experience of chronic pain. Its inception and protraction is more than a purely physical phenomenon. Chronic pain is not an objective measurable experience that can be explained by simple medical models of sensory-input and brain receptor-output. Pain can exist in the absence of injury, and injury in the absence of pain (Turk & Flor, 1999). The most salient example of the former is *phantom limb syndrome*, a condition in which pain in a non-existent limb continues after its surgical removal. Similarly, many people who

suffer from chronic pain do so in the absence of significant physical pathology. This is not to say the person is fabricating the experience of pain. It is, in a sense 'in their heads', as the pain is experienced in the realm of the central nervous system and the brain. The pain may very well be experienced, but through the development of pain neural networks and a range of psychological processes, the pain may no longer be connected to the original site of injury (Shipton, 1999).

1.1 The Biopsychosocial Model

Both the presence of pain in the absence of pathology and the absence of pain in the presence of pathology are accounted for by a biopsychosocial definition of chronic pain (Turk & Flor, 1999). According to this monist definition, mind and body are viewed as a fusion of physical and psychological states, with reference to an individual's pathology, psychological processes, environment and behaviour. The biopsychosocial model is now widely recognised as the most inclusive and powerful explanation for the phenomenon of chronic pain (Turk & Okifuji, 2002). Physical dualist models of pain that viewed the mind and body as separate could only begin to touch on the processes involved in chronic pain. Yet scientific reference to psychological and physiological interactions only began to appear in the late 1960's. The development of an integrated biopsychosocial model occurred as recently as the last fifteen years (Gatchel, 1999).

When considering that what we feel as pain occurs in the brain, and the brain affects what we feel as pain, it is surprising to think that a purely medical model of chronic pain was ever adopted in Western medicine. The brain is concerned with both receiving messages of injury from receptors in the body and with making meaning out of these sensations. Such meaning may be viewed loosely as 'psychology.' Chronic pain is not simply the presence of acute physical pain for an extended period of time. As the

distance in time from the initial injury increases, so too does the influence of psychological and social forces in the experience of pain. This fact is addressed by the 'International Association for the Study of Pain' (2000) where chronic pain is defined as:- an unpleasant sensory and emotional experience lasting for 6 months or longer that may continue *after* the healing of associated trauma or the expected cessation of pain. Therefore, when considering the functioning and general well-being of the chronic pain sufferer, the individual's emotional or psychological functioning is of great importance.

Like the role of psychology in physical pain, the social environment of the patient holds a great deal of explanatory power. Chronic pain, and indeed many forms of stress, involves a wider network than the individual. The family and other social forces impact on the pained individual's well-being, through reinforcement of sick role stereotypes (Fordyce, 1998), and an ability to either alleviate or create demands on the patient. The relationship is not one-way. The afflicted individual also influences those around them. It may be argued that the entire family unit must be considered when understanding the impact of a particular stress such as chronic pain on any family member (Rolland, 1988). This is most lucidly illustrated with respect to the families of sufferers. A long history of research documents the impact of chronic pain and illness on spouses of sufferers. For example, a range of chronic illness and pain conditions in one partner has been linked to depression and other affective disturbances in the other partner (e.g., Rolland, 1994; Shanfield, et al., 1979). Furthermore, the demands of the individual's illness as well as objective indices of the condition are related to spousal depression (Lewis, Woods, Hough et al., 1989). This suggests that it is not just the presence of chronic pain that reverberates throughout the household, but the degree of suffering and debilitation that is attached to the condition. To illustrate the bi-directional nature of the relationship between social forces and the individual's chronic pain, research has documented the effect that spousal

criticism or support has on the chronic pain patient. Those who perceive their spouses to be more supportive and less critical engage in more adaptive coping strategies and display more positive overall adjustment despite pain (Manne & Zautra, 1989).

In contrast to our understanding of spouses, there is a dearth of research on other individual's responses to chronic pain in a family member. Most notable by their absence are the children of sufferers. Yet it may be said that children of sufferers experience the most profound levels of vicarious suffering, as their environment is invariably linked to that of a caregiver. Unlike the spouse, the prospect of separation from the source of stress, and the cognitive resources to understand and deal with the challenges are limited for children. The scarcity of literature regarding children's functioning in the face of parental chronic pain demonstrates a considerable oversight, but presents a unique opportunity of study. The research to follow suggests that children are disadvantaged when growing up with a parent suffering from chronic pain. Perhaps even more so than partners of sufferers.

Chronic pain does not start or end with the individual. Its influence extends beyond the sufferer, to family, friends and colleagues. By exploring the functioning of those around them, insight into the functioning of the chronic pain patient may be gathered. Likewise, focusing on the chronic pain patient may present an opportunity to further understand the plight of family members. Research is needed that examines not only the individual experiencing chronic pain, but also their family members, particularly children. Such research may best be served by a focus on biopsychosocial principles, with reference to the physical, psychological and social influences that may be associated with chronic pain. The family dynamics, the amount and quality of available social support, and the level of affective distress experienced by the sufferer, may provide valuable

insight into the nature of chronic pain, and the experiences of the individual afflicted, as well as family members.

This dissertation focuses on the physical and psychological functioning of mothers with chronic pain as well as their children. A number of goals are achieved. Insight is gathered about the demands of the chronic pain patient, as well as the demands of their children. Additionally, the mechanisms behind the potential relationship between maternal chronic pain and child adjustment will elucidate aspects of living with maternal chronic pain that may create risk for children. This should provide a foundation of how and where assistance and intervention may be offered to children and families in need.

1.2 The Chronic Pain Patient

Chronic pain is a relatively new topic of interest in the medical and psychological worlds. This expansion of interest has coincided with a recent declaration in 2001 by the U.S Congress that the next decade would be one of 'pain control and research.' The prevalence and growth of chronic pain in the Western world is rapidly reaching alarming dimensions (Breen, 2002). Estimates suggest that 7% of the population is affected by chronic pain in the United Kingdom (Bowsher, Rigge, & Sopp, 1991), and 3.3% of the population are permanently disabled as a result of chronic pain in the United States (Lipton, 1991). Recently, an epidemiological study showed that one in five Australians experience chronic pain. (Blyth, March, Brnabic, et al., 2001).

Chronic pain takes its toll in a number of ways. Public health resources are expended to a significant degree (Crook, Rideout & Browne, 1984), and the loss to the workforce and insurance companies presents a dual strain. Not only do the companies lose valuable employees and money, but the individual sufferer may have difficulty in coping with compromised income and self-esteem.

Unemployment is one of the biggest losses for sufferers. For many, the condition may dictate the need to take frequent breaks off work. A loss of motivation to stay in work or to look for more adaptable work may ensue. It is questionable whether employers are willing to accommodate to these needs. As would be anticipated from a biopsychosocial model, the burden of chronic pain is far reaching and not merely confined to the need for monetary resources to deal with physical debilitation. A range of negative affective outcomes, such as anxiety and depression, is commonly associated with chronic pain (Diener, van Schayck, & Kastrup, 1995; Katon, & Sullivan, 1990). It has been suggested that between 40% to 50% of chronic pain patients suffer from associated depression (Turk & Flor, 1999). Anger and frustration may also become issues and further exacerbate the condition (Kerns, Rosenberg, & Jacob, 1994). It may be impossible to separate the emotional experience from the overall experience of pain, indicating chronic pain to be a substantial blow to the sufferer and to society.

Considering the difficulties facing chronic pain sufferers, it is not surprising that depression, anxiety, and anger are commonly found. Sufferers must cope not only with the pain itself, but in many cases, with limited access to medical assistance and information. The experience of intermittent hope and then disappointment with new treatments, and the difficulties associated with insurance, employers and government-funded benefits may also take their toll (Turk & Flor, 1999). Indeed, many chronic pain patients report almost every facet of their life to be affected. Minor aspects of life that most people take for granted can add to the sense of burden and of loss experienced by the pain sufferer. For example, public transport can jar and exacerbate chronic back or neck pain; cooking and cleaning can be difficult with arthritis and wrist injuries; and basic activities can be debilitating when a migraine strikes.

The parenting efficacy of the chronic pain sufferer may also be affected by their condition. The physical and mental debilitation associated with many forms of chronic illness with pain may undermine the performance of even every-day parenting tasks. Crucial principles involved in effective parenting are parental sensitivity and involvement (Belsky, Robins & Gamble, 1984). Chronic pain is likely to impede both. For example, a parent's involvement in basic tasks (such as lifting or feeding young children) may be very difficult when pain strikes. The use of certain medications often renders parents unable to provide transportation to school and other important social events, with all family members feeling a sense of 'missing out' (Nehring & Cohen, 1995). Emotional distress such as hostility and depression may impact on parent's tolerance, patience and sensitivity and pose an emotional hurdle to the development of a supportive and caring parent-child relationship (Dutra et al., 2000).

However, not all individuals with chronic pain live with suffering and debilitation. The existence of human resilience and mental fortitude ensures that anxiety, depression and anger do not affect every chronic pain sufferer. Psychosocial issues seem to explain at least some of the disparities in levels of affective distress seen between different individuals dealing with similar conditions. The most ubiquitous and consistent of these psychosocial variables in the literature are the sufferer's mental health, social support and coping efforts.

Coping efforts can either be directed toward changing some aspect of the environment (problem focused coping) or one's emotions (emotion focused coping) (Lazarus & Folkman, 1986). Examples of problem focused coping in response to chronic pain include searching for new or alternate methods of pain relief, or discovering more about the pain condition in order to understand its cause and treatment options. Examples of emotion-focused coping are denial, escape tactics to 'get away from it all' and 'wishing

it away.' Coping responses may be dual-focused, to accomplish both emotion- and problem-focused coping, such as exercising to both manage anxiety and control the body's response to disease (Compas et al., 1996). A combination of emotion- and problem-focused coping seems to have the most adaptive function (Mattlin, Wethington & Kessler, 1990). Individuals are advantaged if they first deal with their negative emotions and then tackle the problem itself. In chronic low back pain, excessive emotion-focused coping strategies are related to higher levels of pain, disability and depression (Klapow et al., 1995). This suggests that individuals too intent on focusing inwards to find respite from chronic pain, may not only exacerbate their condition but also develop associated mental health problems. So although some emotion-focused strategies, such as relaxation or seeking comfort form others, may prove to be effective strategies for sufferers, it is likely that over-reliance on such efforts is associated with negative outcomes. Over-reliance on emotion-focused efforts to the detriment of active problem-focused coping may also prove to be deleterious for sufferers.A further connection has been made between coping and depression. Depressed pain sufferers are more likely than non-depressed sufferers to report passive or avoidant strategies (Weickgenant et al., 1993). Psychological variables in the experience of pain are therefore likely to be highly interconnected.

Social support seeking may be used by the patient as a method of dealing with the stress of illness or pain (Schreurs & de Ridder, 1997). This includes patients seeking out friends and family to help with the condition demands, or to provide general emotional or moral support. Findings are mixed in terms of whether chronic pain patients are advantaged by higher levels of social support. Some research documents that more social support seeking is associated with less pain and that social network resources provide tangible services and information, to make the experience more positive for the entire family (Lewis et al., 1989). However, high levels of social support have also been

associated with increased pain behaviours (Gil et al., 1987). Social support may enhance attention, sympathy and nurturance that many chronic pain sufferers embrace when it becomes difficult to cope. Individuals may engage in further pain behaviours to evoke such support. This attention could ultimately disadvantage sufferers and promote the presence of pain through reinforcement of the sick role (Fordyce, 1988).

Although social support often refers to assistance provided by a wide range of individuals and agencies, the workings of the family may have a more immediate effect. Family dynamics, such as increased family conflict and decreased cohesion, are associated with severity of physical pain as well as depression (Dura & Beck, 1988; Feuerstein, Sult, & Houle, 1985; Romano, Turner & Jensen, 1997). Clearly, the emotional functioning of the entire family is connected to the physical and psychological health of its members, and may be part and parcel of the experience of chronic pain.

Psychosocial variables such as mental health, family environment, coping and social support seem to provide a better explanation of suffering related to chronic pain than do objective measures of pain. Differences in functioning may be less due to the kind or severity of chronic pain condition, and more to do with adaptation to and perceived demands of the condition. While the broad definition of chronic pain covers a number of diverse conditions from back ache to neural pain and migraine, they all represent a unitary classification that centres around psychosocial forces. The experiences of chronic pain sufferers are relatively unrelated to more objective measures of chronic pain. The source or kind of pain is a poor predictor of differences in functioning (Anderson & Rehm, 1984). Similarly, the chronicity of the pain condition is relatively inconsequential to treatment response and level of adaptive functioning (Fow & Smith, 2001).

Psychosocial variables play a formative role in the experience of an individual's pain and their impact on the rest of the family needs to be understood. Social support and

the family environment may be as important to children as to afflicted parents. Children may be enmeshed in the parent's inability to work and carry out many aspects of day to day life, as well as in their associated frustration, anxiety and depression. As will be discussed, children are likely to be highly sensitive to the demands of parental chronic pain. Due to the lack of research in this area the picture is still somewhat unclear.

1.3 The Children of Chronic Pain Patients

Reviews on the potential impact of parental chronic pain on children outnumber empirical examinations of the question by a considerable margin. The reviews and research point to a number of potential negative consequences for children living with protracted physical pain in the parent. Children may be restricted from engaging in age-appropriate behaviour and social activities whilst the family's primary focus is attending to the sick parent. With the family's energy and resources potentially diverted away from the child, the risk of decreased supervision, attention, and affection is substantial. Child problem behaviour and compromised relationships may ensue (Armistead, Klein & Forehand, 1995). The parent may also become a negative role model for the child. The child could develop a preoccupation with their own health and sensations of pain to receive attention and to get closer to the sick parent. Where sick parents experience heightened affective distress, children may themselves adopt frustration, anger and dysphoria in response to stress.

Theoretically, having a chronically sick parent may not always result in adverse social and emotional consequences for children. Physically debilitating conditions in a parent may have the effect of 'making' the child, by facilitating growth and independence. This is consistent with the conceptualization of development involving *both* gains and losses (Baltes, 1987). An oft-cited example is the relationship between schooling and creativity: attending school leads to advances in children's cognitive abilities but may

produce a temporary decrease in their creative abilities (Winner, 1982). In the same way, parental chronic pain may provide advantages and disadvantages for children. The children of parents with chronic pain may be deprived in some ways, however, the development of positive characteristics such as independence or self-reliance may simultaneously unfold. These sorts of divergent developmental trajectories are shown in children of parents with diseases such as AIDS and cancer (Armistead & Forehand, 1995; Baider, Cooper & De-Nour, 1996). Here, parents place immense emphasis on the time they have with their children and value their role as a parent, leading to positive outcomes for the child.

Due to the terminal nature of many cases of AIDS and cancer, advantages may only be associated with short-term conditions and a consequent reassessment of time remaining. The positive outcomes may not extrapolate to chronic pain patients and their families. By definition, chronic pain means that the demands may remain indefinitely and have long-term consequences for afflicted parents and children. Indeed, research suggests that positive effects of parental illness are unlikely to be associated with an extended or indefinite course of illness or pain (Doherty & Campbell, 1988). Empirical research documenting the effects of parental chronic pain is suggestive of predominantly negative responses in children. Therefore, the hypotheses offered in the dissertation predicted maladjustment in children living with maternal chronic pain, rather than increased adjustment compared to controls.

1.3.1 Empirical evidence of compromised child functioning

Many of the findings to date are limited in the sense that the chronic pain group was not the primary focus of exploration, sample sizes were small and a control group was not used. Despite these general limitations, some important, albeit tentative conclusions can

be drawn regarding the plight of children living with a parent with chronic pain. The majority of these conclusions suggest children are disadvantaged in the face of parental chronic pain.

Hirsch, Moos and Reischl (1985) compared the psychosocial adjustment of adolescent children of non-ill parents to those of parents suffering from 1) depression and 2) arthritis. The number of participants was limited, with only 16 arthritic patients. All but one arthritic patient had been afflicted with the disorder for at least one year, suggesting that children had time to establish their behaviour in response to the condition. Internalizing behaviour, such as depression and anxiety was measured in the children. Children of arthritic parents reported poorer self-esteem, higher levels of depression, and less involvement in school activities than children of non-ill parents. The behaviour of children with parents suffering from arthritis was similar to children of clinically depressed parents. This is a concern given the range of long-term negative consequences that affect many children of depressed parents (Goodman & Gotlieb, 1999). Not only do the findings suggest that the presence of parental chronic pain is a considerable source of stress for some children, but also that similar processes may operate in families afflicted by parental physical pain and psychological distress. There was no provision, however, to explore systematically the kinds of factors that lie behind these similarities. It is possible that depression in the arthritic group explains the parallel between groups.

A number of studies examined the presence of painful conditions that do not arise from a specific disease. A study comparing the functioning of 21 children of parents suffering from chronic lower back pain (CLBP) to a similar number of children with parents suffering from diabetes and no illness or pain, revealed the chronic pain patients' children to have more problem behaviour (Rickard, 1988). Externalizing behaviour in the form of conduct problems and a variety of internalizing problems, such as anxiety and

somatizing disorders (the tendency to experience and communicate psychological distress in the form of physical symptoms) were evident in children of men suffering from back pain. The diabetic patients' children showed behaviour ranging in between that of the more severely disturbed children and those of the non-ill parents. Interestingly, the three groups of parents did not differ on levels of depression, suggesting CLBP to impact on the children via means other than parental depression. Whereas the CLBP fathers were unemployed, the diabetic patients continued to work. This points to financial stress as a possible factor in the CLBP group. Children of CLBP fathers may be provided with greater opportunity to model pain behaviour, as bracing and avoidant activity responses are associated with back pain (Dickens, Jayson, & Creed, 2002), that children may have observed.

There is cross-cultural support for the idea that children are affected by their parent's condition through modeling. In India, Chaturvedi and Kanakalatha (1989) found that in a sample of 17 pain patients, 6 of their children experienced pain as well. Moreover, the site of the child's pain was identical to that of their parent, with pain parents responding to their children's pain with worry and concern and excusing children from work or study. This kind of attention and exemption from unpleasant activities may provide a very direct source of reinforcement for children's own somatizing and pain behaviour. There is evidence that parents with chronic pain are over-attentive to pain and illness in their children (Raphael, Dohrenwend, & Marbach, 1990). This provides further evidence that parents may reinforce pain behaviour in their children. It is also evidence that children may imitate their parent's pain. The sharing of identical pain sites is concerning, especially in terms of the children's possible future status as a pain sufferer.

Mikail and von Baeyer (1990) studied the effects of parental chronic pain on children where the pain resulted from migraine headaches. Participants included 38

migraine sufferers and their 9- to 17- year old children and a matched control group of non-ill parents and their children. Children of parents with migraines scored significantly higher on general adjustment and delinquency scales. Closer analysis revealed both externalizing behaviours such as impulsivity and distractibility and internalizing disorders like depression and apathy. The children of migraine sufferers were more somatically focused, displaying increased concerns with health status and bodily functioning. Moreover, parental depression and anxiety were highly correlated with child depression and anxiety, indicating parental psychological adjustment plays a role in the link between parental chronic pain and child adjustment.

In another examination of the effects of general parental chronic pain on children, Chun, Turner, & Romano (1993) compared the functioning of children of 35 chronic pain patients and 35 healthy controls. The children in the pain group were rated by teachers (but not parents) as having significantly more behaviour problems (consistent with internalizing and externalizing behaviour) and significantly less social competence than children in the control group. Functional disability in the adult was associated with child behaviour problems. A range of other variables, such as the presence or absence of chronic pain, patient gender, and depression and marital satisfaction were not associated. In this case, the manner in which the parent viewed his or her condition was of particular importance to the child's functioning.

There is further support for the notion that the parent's *subjective* level of suffering or affective distress to be an important predictor of the child's psychosocial adjustment. Jamison and Walker (1992) found that children of chronic pain patients reported high levels of somatization in the form of frequent abdominal pain and medication use. This was especially true in families where parents expressed negative emotion associated with their pain. The findings indicate that it is the parent's *response* to their pain that

influences the child's reaction and subsequent behaviour. Specifically, the findings suggest that the more extreme and visible the parent's reaction to their condition, the more the child is affected.

As evocative as these findings may be, the link between parental chronic pain and child functioning is not conclusive. Roy and colleagues (1994) reported that only 3 children out of 31 families demonstrated behaviour consistent with internalizing and externalizing problems such as depression and 'acting out' behaviour. Another study examined children's functioning in families with maternal major depression, bipolar disorder, physical illness, and no illness over a two-year period (Anderson & Hammen, 1993). The 18 children of mothers with major depression fared the worst in terms of problem behaviour. Controls were the least impaired, and the children of physically ill parents evidenced behaviour similar to that of controls, indicating no particular risk to psychosocial adjustment associated with the parental condition. These two studies, however, are subject to a range of limitations including small sample sizes, and the limited use of control groups. Only a narrow band of children's behaviour was examined, with no reference to children's physical functioning.

Considering these limitations, the findings do not rule out the notion that children suffer in the face of parental chronic pain. The evidence to date weighs heavily in support of the notion that children are not impervious to the effects of parental chronic pain. It is likely that the small sample sizes in the above studies did not provide sufficient power to detect such an effect. The findings indicate that only certain kinds of children and families are affected. A focus on the mechanisms involved in the likely relationship between parental chronic pain and child outcome is needed to understand why some children may be affected, and others not. That is, what processes in parents, families or children lead to compromised or enhanced functioning in children? Arguably, the

application of risk and resilience principles is fruitful in any research paradigm concerned with stressors and competence in children (Luthar & Cushing, 1999), including the impact of parental chronic pain.

Despite the piecemeal nature of understanding in the research literature to date, it is possible to theorise about some of the *mechanisms* that may exist (Armistead, Klein & Forehand, 1995). From a developmental perspective, it is important to understand exactly *how* a parent's chronic pain comes to impact on or fails to affect their children. The Mikail and von Baeyer (1990) study suggested parental depression explains the differences in functioning between control children and children living with parental chronic pain. Likewise, parental stressors (such as reduced capacity to work and general negative family functioning) may offer insight into the overlap between parental chronic pain and child adjustment (Rickard, 1988; Stuifbergen, 1990). The parent's adoption of negative parenting strategies as a result of pain and stress may also explain the incidence of maladjustment in children (Dutra et al., 2000). Clearly, a number of variables may explain or mediate the relationship between parental chronic pain and child adjustment, although these still lie within the theoretical realm. It is of primary importance, however, to determine whether or not a relationship exists between parental chronic pain and children's adjustment. That is, are the two associated? Do children living with parental chronic pain fare worse than control children living with healthy parents?

1.4 The Present Dissertation

Adopting a purely mechanistic perspective to the relationship between parental pain and child functioning could be viewed as a case of putting the cart before the horse. Despite some initial theoretical support for such an association, the question of whether parental chronic pain even has negative outcomes for children, still remains. The present research

addresses many of the limitations in the literature. This is achieved by a progression of questions. The dissertation starts with the functioning of the parent with chronic pain, moves through to the functioning of the children, and ends with an exploration of what might explain the relationship between parental physical pain and child functioning. A wide range of mental and physical health indices were examined firstly in the parent and then the child, in comparison to a control group.

Contrasting the functioning of parents with chronic pain to a control group is a unique contribution. It enables an understanding of the relative extent of difficulties experienced by parents with chronic pain. Although there is no scarcity of research examining the functioning of the chronic pain patient from a biopsychosocial perspective, this has been infrequently achieved in comparison to control groups. Variables such as mental and physical health along with social support, family environment, coping and parenting were therefore observed in mothers with chronic pain and healthy mothers. Parenting efficacy was a novel offering to the area as little is known about how a parent's role may be compromised due to chronic pain. Such an examination of the mother's psychosocial functioning is consistent with the notion that the primary goal in an examination of child psychopathology is determination of risk (Luthar, Cicchetti, & Becker, 2000). Having mothers with chronic pain reporting functioning in these areas is one step closer to answering the question of whether children are affected by parental chronic pain and risk. Comparing control and chronic pain parents on the psychosocial dimensions provides a starting point to consider possible mechanisms.

An attempt to narrow the field is to include only mothers with chronic pain. Figures show that women are more likely to be sensitive to chronic pain conditions such as chronic fatigue syndrome and migraine (Blyth et al., 2001; Robinson, Wise, & Riley, 1998). The woman's functioning in home and work settings may be compromised as a

result of chronic pain (Sheffer et al., 2002). These facts make it imperative to further understand women and mothers with chronic pain, and the impact of their conditions on their children. This is not to say that the effect of *paternal* chronic pain on children is insignificant or even minimal. It may be as important to understand this relationship. Fathers with pain represent another research paradigm that is outside the scope of the present examination. It may be likely that important differences exist when mothers as opposed to fathers are affected by chronic pain.

A wider review of parental cancer and AIDS indicates that children may be affected differently depending on whether their mother or their father is the sufferer (Armistead, Klein & Forehand, 1995). It is possible that a relationship exists between parental and child gender, and type of condition, and certain illness conditions. For example, maternal cancer impacts on girls more than boys, yet a range of negative responses are revealed in children of both sexes when fathers have haemophilia (Steele, Forehand & Armistead, 1997). There is not sufficient depth of literature, however, to understand these differences and who impacts more strongly on children's functioning. To simplify these complicating variables, the present study was limited to mothers, and chronic pain (rather than including fathers and conditions such as cancer and AIDS).

It is important not to confuse chronic illness with chronic pain. Some knowledge can be extrapolated from the wider literature of parental chronic illness to parental chronic pain, although with caution. Chronic pain can be seen to represent a fairly unitary domain, covering a number of diverse conditions (Anderson & Rehm, 1984). Chronic pain can be contrasted with many forms of non-painful chronic illnesses, where pain may be either limited or non-existent, or lead to terminal outcomes. Parents suffering from chronic pain may have a certain amount in common with parents suffering from cancer, AIDS and Multiple Sclerosis. However, important differences exist, with many cases of

cancer and AIDS involving a parent's impending death. This makes the burdens and experiences of family members living through a terminal parental illness distinct from those dealing with protracted suffering and chronic pain in the parent. Maternal chronic pain not associated with terminal consequences was examined in the present research.

1.5 Overview of Chapters

The aim of the research is to advance understanding of the child in the context of a little considered stressor, namely maternal chronic pain. The issues that were addressed can be divided into three primary questions. Firstly, what is the precise nature of the functioning of the mother with chronic pain that may denote a considerable form of stress to which children may be exposed? Secondly, are children of mothers with chronic pain disadvantaged as a result of maternal chronic pain? If so, what aspects of their adjustment are affected? Thirdly, which variables lie at the heart of the relationship between maternal chronic pain and child functioning and explain how children are affected?

The first study (Chapter 2) addresses the functioning of the mother with chronic pain. Mothers with chronic pain are compared with control mothers on a range of psychosocial and physical health indicators. Although the biopsychosocial model underpins the theoretical rationale of the present dissertation, the focus remains on the psychosocial variables. This is due to the psychological nature of this research, and the likelihood that psychosocial stressors can be the most formative influences in children's own psychosocial functioning.

The second study (Chapter 3) addresses the functioning of the child living with maternal chronic pain. Specifically, the psychosocial and physical health of children is compared to the functioning of control children living with mothers without pain. This allows for an examination of the extent to which children may be affected and a

determination of whether the differences are clinically significant. Gender differences are examined.

The third study (Chapter 4) further elucidates the link between maternal functioning in the face of chronic pain, and child functioning in the face of maternal chronic pain through unveiling the mediators underlying this relationship. A range of psychosocial variables are examined, but specific reference to parenting processes is made. Unlike more distant psychosocial variables that pertain predominantly to the mother, parenting represents a clear overlap between mother and child functioning. Parenting processes clearly involve the interplay of both members of the dyad. The mother's parenting behaviours and the quality of the mother-child relationship are examined as potential mediators of the relationship between maternal chronic pain and child psychosocial and physical adjustment.

The concluding chapter of the dissertation (Chapter 5) summarizes the preceding chapters to draw together the primary emerging themes. Practical issues are addressed, with particular reference to interventions that may be directed at reducing the suffering of this group of mothers and children. Chapters 1, 2, and 3 are based on manuscripts that have been submitted to or accepted by peer reviewed journals. As a consequence, these sections may contain some repetition.

CHAPTER 2:

PSYCHOSOCIAL FUNCTIONING OF MOTHERS WITH CHRONIC PAIN: A COMPARISON TO PAIN-FREE CONTROLS[1].

2.1 INTRODUCTION

Perhaps the most salient example of how psychology and physiology meet is the role of personal and social characteristics in the development and maintenance of chronic pain. The manner in which an individual copes with adversity, the degree of social support available, and the climate of the family, are all powerful influences in the lives of individuals. The chronic pain sufferer is perhaps even more subject to these internal and external forces. Under a biopsychosocial definition of chronic pain, a patient's individual psychology as well as their wider social context influences the degree of physical impairment present (Turk & Flor, 1999). The interpretation of pain, how it is dealt with, and social factors including available support and the encouragement of sick-role stereotypes, are thought to impact on the experience of chronic pain (Turk & Okifuji, 2002). The complex interplay between an individual's psychology and their physical functioning is illustrated with the observation that pain may signal a decrease in work and day-to-day activities for some sufferers, yet not for others.

The literature has identified the importance of a range of psychological and social factors in the onset and persistence of chronic pain conditions (Linton, et al., 2000). The psychological processes that have been most often linked with chronic pain

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include factors such as depression and anxiety, and the individual's coping mechanisms. Much research has been concerned with the presence of depression and anxiety in relation to chronic pain (Diener, et al., 1995; Guthrie, 1996; Katon, & Sullivan, 1990), the implication being that mental processes are relevant to the individual's level of *suffering* (Fordyce, 1994).

An individual's manner of coping has been related to the perceived severity of chronic pain. Emotion-focused coping, or an avoidant response such as denying pain or wishing it away can be distinguished from problem-focused coping, which is an attempt to do something about the problem (Lazarus & Folkman, 1986). Emotion-focused coping strategies have been related to higher levels of pain, disability and depression in sufferers of chronic low back pain (Klapow et al., 1995). For some suffers, however, any kind of coping strategy may work to alleviate suffering, including emotion focused strategies to manage the negative emotional distress associated with chronic pain (Klapow et al., 1995).

A connection has been made between coping and depression, with depressed pain patients more likely than non-depressed pain patients to report passive or avoidant strategies (Weickgenant et al., 1993). This suggests that psychological forces operate in a complex, interconnected and potentially bi-directional manner.

In terms of social influences in chronic pain, the sufferer's social support and the family environment have emerged as two primary areas of importance. Social support can increase quality of life of chronic disease and pain sufferers (Schulz & Decker, 1985). Social support may also be seen as a less positive influence, in that high levels of social support have been associated with increased pain behaviours (Gil, et al., 1987). It is possible that social support is seen by the sufferer as positive in that it provides attention and care that is enjoyed by the sufferer and contributes toward a sense of value. It may ultimately, however, prove to be counter-therapeutic Through

reinforcement of the sick role, attention and support may promote the presence of pain for some individuals.

Social support often refers to assistance provided by a wide range of individuals and agencies, but the workings of the family may have a more immediate effect. For example, family dynamics such as increased family conflict and decreased cohesion amongst family members have been associated with severity of physical pain as well as depression in chronic pain patients (Dura & Beck, 1988; Feuerstein et al., 1985; Romano et al., 1997).

Depression and mental health issues are common themes in the literature examining the psychosocial influences in chronic pain. Their ubiquity is such that it may be challenging to distinguish the unique contribution of any psychosocial influence independent of the sufferer's psychological health. Depression seems to be the companion of chronic pain, and emerges as a common theme in the study of other psychosocial processes. It has been suggested that the relationship between coping and chronic pain may be confounded by the presence of depression, that is associated with avoidant coping efforts as well as chronic pain (Turner & Romano, 1984; Romano & Turner, 1985). The possibility that a range of psychosocial variables may be affected by the patient's mental functioning makes it important to examine the contribution of variables, such as social support, coping, and family environment, to the sufferer's functioning, independently of mental health. This research will therefore attempt to explore whether chronic pain is associated with certain coping efforts, social support and family dynamics simply because the individual is depressed, or whether these processes provide a unique set of influences in the experience of chronic pain.

Another important area that has been largely unexplored is that of the *parent* with chronic pain. Precise numbers have yet to be ascertained, but it is likely that many people living with chronic pain are involved in the demands of providing care and

support for dependent children (Armistead et al., 1995). Providing quality parental care may be a significant challenge while living with ongoing pain. Certain conditions such as arthritis may restrict a parent's ability to engage in physical affection and play. For others, the accompanying psychological distress of ongoing pain may prove a more insidious barrier to developing a healthy and intimate parent-child relationship.

There is some research to suggest that mothers with chronic illness such as narcolepsy and HIV sustain a reduction in parenting efficacy (Nehring & Cohen, 1995). This includes moderate to severe difficulty in engaging in a range of day to day parenting tasks such as hugging children and providing meals and transportation, as well as poor parent-child relationship quality and less supervision compared to controls (Dutra et al., 2000). Unfortunately, parenting in conjunction with a range of other psychosocial variables in the context of chronic pain is yet to be understood. Where the parenting of chronic pain sufferers has been examined, it has not been placed in a biopsychosocial context. It is also possible that chronic pain conditions come with their own specific demands that may be distinct from chronic illnesses, and not necessarily associated with ongoing pain (Rolland, 1988). The research above indicates the presence of compromised parenting in the face of chronic illness. Given the presence of daily debilitating pain for many chronic pain patients, it is possible that parenting problems will be even more evident in parents with conditions characterised by chronic pain. The present research offers a unique insight by exploring the functioning of mothers with chronic *pain*. The present study included mothers with chronic pain due to the relevance of these issues for them. More women than men are affected by chronic pain (Blyth et al., 2001). More mothers than fathers are involved in primary care-giving tasks (Milkie et al., 2002).

On a par with the noted reductions in psychosocial variables such as effective coping, psychological adjustment and social support, it is possible that parenting

efficacy will emerge as an important variable compromised as a result of chronic pain. This may have important consequences for not just the individual with chronic pain, but for the entire family, especially children. If research into parenting in the context of chronic pain is meagre, then understanding the impact of parental chronic pain and its associated difficulties on children, is modest at best (Armistead et al., 1995). The focus in this research on the psychosocial differences in families experiencing maternal chronic pain in comparison to controls, achieves the dual purpose of understanding the chronic pain parent, as well as the demands and risk to which their children may be exposed. Given the reciprocal nature of the biopsychosocial approach, where each variable affects the other (Turk & Okifuji, 2002), the psychosocial and physical adjustment of the mother and the child may also overlap.

The role of psychosocial variables in the functioning of the chronic pain sufferer has been highlighted in the literature. The majority of this work, however, does not include control group comparisons. Yet the use of control groups is essential to provide a comprehensive understanding of the specific issues pertinent to the functioning of the chronic pain patient and mother. If the differences in adjustment between chronic pain patients and controls are unknown, the patient's degree of relative suffering and compromise is not understood. An important contribution of the present research is the use of a control healthy group to contrast the functioning of parents with chronic pain.

The primary aim of the study is to compare the psychosocial functioning of chronic pain mothers to the functioning of pain-free controls. The underlying rationale is to explore the notion that a mother's chronic pain has implications for her child. To this end, a range of maternal physical and psychosocial indices are examined. Firstly, it was hypothesized that mothers with chronic pain experience reduced functioning compared to control mothers, including less parenting efficacy, a range of mental health

issues, the use of less adaptive emotion-focused coping strategies, less satisfaction with social support, and increased family dysfunction. Secondly, to determine whether these differences were simply a result of mental health disparities, it was hypothesised that after controlling for maternal mental health, psychosocial factors such as coping, social support, family environment, and parenting strategies would emerge as strong influences in physical functioning scores. Thirdly, it was hypothesised that mental and physical health, and coping and social support would emerge as significant predictors of parenting scores. By determining the influences of compromised parenting, steps can be taken to diminish the care-taking demands of the mother with chronic pain.

2.2 METHOD

2.2.1 Participants

The pain group consisted of thirty-nine mothers with a range of chronic pain conditions (experienced for 6 months or more). The control group consisted of thirty-five pain-free mothers. The mean age for mothers in the control group was 38 years; the mean age for mothers in the chronic pain group was 37 years. A variety of chronic painful conditions were represented, including chronic back pain, migraine, arthritis, endometriosis and chronic fatigue syndrome. Some mothers had more than one painful condition (range: 1-5). The duration of conditions lasted an average of 11.2 years (SD = 8.49; range 1-45 years). Mothers rated their pain severity as quite high, with 70% reporting that they experienced pain on a daily basis. Over 80% made frequent use of medication to relieve their pain.

2.2.2 Procedure

Both groups were recruited by advertising in newspapers and on the radio, as well as by posters in doctors' waiting rooms. Approximately equal numbers of each group

responded to the recruitment strategies. Mothers were visited in their homes by the principal investigator. They completed a consent form as well as a battery of questionnaires on their physical and mental functioning, as well as psychosocial variables. They were left to complete the questionnaires in a quiet area of the house, with the researcher available for assistance. This took approximately 2 hours.

2.2.3 Measures

Background Information Questionnaire: This contained a number of questions relating to the family's demographic or background information, such as the mother/partner's highest level of education and total family income. It also included questions about the mothers age, number of children, and children's age and sex.

RAND-36 Health Status Inventory: This is a 36-item measure of general health status that assesses 8 constructs, (physical functioning, role limitations due to physical health problems, pain, general health perception, emotional well-being, role limitations due to emotional problems, social functioning and energy/fatigue). The questionnaire has been used with a variety of populations experiencing chronic pain or physical ill-health (Shiely et al., 1996). Acceptable reliability as well as convergent and discriminant validity have been reported (Hays, 1998).

Brief Symptom Inventory (BSI): This is a 53-item self-report inventory designed to assess psychological distress in psychiatric, medical and non-patient respondents. The primary symptom dimensions include somatization, obsessive-compulsive behaviour, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. An overall BSI t-score is obtained by averaging the dimensions. Adequate reliability and validity have been reported (Derogatis, 1993).

Ways of Coping Checklist (WCCL): This consists of 5 scales designed to assess problem and emotion-focused coping (Lazarus & Folkman, 1986). The scales include

problem-focused coping, wishful thinking, seeking social support, avoidance, and self-blame (Vitaliano et al., 1985). The scales have acceptable reliability and validity and are aggregated to comprise a problem-focused coping score and emotion-focused coping score (avoidance, wishful thinking and self-blame). Seeking social support contains elements of both, and was not included in aggregate scores. The chronic pain group completed the questionnaire for their painful condition, while control mothers did so for what they considered to be a major problem.

Social Support Questionnaire (SSQ): Respondents are asked to list the number of people who they can count on for a given listed problem, and then rate their overall satisfaction with the support received on a scale of 1 (very dissatisfied) to 6 (very satisfied). Alternatively, respondents could circle 'no one' if they feel that no support is received. There are 27 items. The overall number of supports and satisfaction with support scores are obtained by dividing the sum of all items by the number of items. The SSQ has acceptable reliability and validity (Sarason, Levine, Basham, & Sarason, 1983).

Family Environment Scale (FES): Three main family dimensions of interpersonal relationships that provide 10 subscales are measured (Moos & Moos, 1981). These are family relationships (cohesion, expressiveness, and conflict); personal growth and development (independence, achievement orientation, intellectual-cultural orientation, active-recreation orientation and moral-religious emphasis), and system maintenance (organization and control). The FES is widely used, and the subscales have reported moderate internal consistency and discriminant validity (Stuifbergen, 1990).

Parenting Tasks Index (PTI): This measure is designed to assess the impact of chronic illness and pain on the performance of parenting tasks, such as lifting, feeding and transporting children (Nehring & Cohen, 1995). The scale assesses the degree to

which parents are physically debilitated by their health in terms of carrying out day-to-day child rearing tasks. The scale has been used with both chronically ill and control parents. Two developmentally sensitive versions are available, for children 10 years and under, and for 11-21-year-olds. Response items are scaled from 0: 'no difficulty and requiring no effort' to 3: 'severe difficulty requiring great effort.' A total PTI score is obtained from the sum of items. Acceptable reliability (including test-retest and internal consistency reliability, and content validity) has been reported for the scale (Nehring & Cohen, 1995).

2.3 RESULTS

The results test the hypothesis that mothers in the chronic pain group display compromised physical and mental health as well as psychosocial difficulties compared to controls. To account for the possibility that this may have been due to demographic differences between the groups, a series of t-tests for independent samples for continuous data and chi-squares for categorical data were performed. As shown in tables 2.1 and 2.2, the groups were not significantly different on any of the maternal or family variables apart from income level [$t\ (72) = -2.29, p < .05$]. The difference observed corresponds to families in the chronic pain group reporting an average annual income of between $20,000 to $29,999, compared to an average income of $30,000 to $49,999 for the control group. The control group's income level is representative of the general population of New Zealand, which is reported to be $38,688 annually (Statistics New Zealand, 2002), while the chronic pain group is clearly lower than average. This highlights a well known reduction in income related to health problems (Wagstaff & Doorslaer, 2000). Chronic pain sufferers are often required to cut back on hours at work or give up work altogether. The lack of a difference in employment between the

groups suggests that the reduced income may have arisen from a decrease in full-time work in the chronic pain group. Due to the income differences between the groups, all further regression analyses examining group differences controlled for income level.

Table 2.1 Demographic differences between groups: descriptive and t-test data

	Descriptive Data			T-test
	Group	n	Mean	SD	t (df)
Mother's age	Pain	39	37.41	5.28	-.68 (72)
	Control	35	38.26	5.51	
Education	Pain	39	4.62	1.89	.101 (72)
	Control	35	4.57	1.84	
Family income	Pain	39	4.95	2.10	-2.29 (72)*
	Control	35	5.97	1.69	
Partner education	Pain	30	4.70	2.05	1.45 (72)
	Control	30	3.93	2.03	
Mean number of children	Pain	39	7.84	2.68	1.10 (72)
	Control	35	7.17	2.59	
Mean age of children	Pain	30	2.17	1.02	-1.12 (72)
	Control	30	2.42	.88	

note: *$p < .05$

Table 2.2 Demographic differences between groups: descriptive and chi-square data

	Group	n	Percentages	Chi-square
			Co-habit: Single	
Marital status	Pain	39	27: 26	0.95
	Control	35	19: 28	
			Pakeha: Non-pakeha	
Ethnicity	Pain	39	43:10	0.43
	Control	35	42:5	
			Employed: Unemployed	
Employment	Pain	39	16: 23	2.66
	Control	35	21:14	

note: Pakeha refers to European or non-Maori people; *$p < .05$

2.3.1 Physical and psychosocial differences between the groups

Tables 2.3 and 2.4 present descriptive data and hierarchical regressions analyzing mothers' responses on the questionnaires while accounting for the disparate income levels. Hierarchical regressions were used with income entered at step 1. Group differences that were found controlled for the disparate income levels.

In only a few cases, income emerged as a significant predictor of mother's mental and physical health, but in all cases, the grouping variable went on to predict significant additional variance in functioning. Chronic pain mothers demonstrated significantly higher levels of almost every problem mental and physical health behaviour listed. On each of the RAND-36 dimensions, they scored significantly lower on the physical and mental health dimensions than control mothers. Mothers with chronic pain have compromised physical health in the form of decreased physical functioning and role limitations, more negative perceptions of their health, and increased pain and illness behaviour. Chronic pain mothers reported a number of psychological difficulties, from increased obsessive-compulsive symptomology, to psychoticism, depression and anxiety.

The groups also differed on a number of psychosocial variables. The chronic pain group reported significantly less social supports, both in number and quality. This showed that they had less family, friends or other networks to count on in time of need. Different coping strategies were favoured by mothers with chronic pain. These included active or problem-focused coping and passive, emotion focused strategies (such as wishful thinking and avoidance) which have been linked to negative outcomes (Katz, et al., 1996). With regard to the general family environment, the chronic pain group reported less cohesion, less expressiveness, more conflict, and devoted less time to recreational pursuits. They reported more highly controlled families.

Table 2.3 Maternal differences in mental and physical health.

	Descriptive Data			Regressions			
	Group	Mean	SD		R^2change	F change (df): (1,72; 1,71)	ß
RAND-36 Health Status				Step			
Physical functioning	Pain	26.23	13.5	1.	.06	4.87*	25*
	Control	52.31	7.60	2.	.53	92.21	.75**
Role limitations	Pain	29.77	10.66	1.	.06	4.74	.25*
	Control	52.94	7.06	2.	.57	106.32	.77**
Pain	Pain	31.23	10.85	1.	.12	9.45	.34**
	Control	54.11	7.14	2.	.51	98.16	.74**
Health perceptions	Pain	34.38	10.27	1.	.04	2.68	.19
	Control	55.66	7.10	2.	.56	97.35	.77**
Emotional well-being	Pain	43.10	8.75	1.	.01	0.49	.08
	Control	52.77	6.71	2.	.28	27.38	.55**
Emotional role limitations	Pain	39.51	13.29	1.	.03	1.98	.16
	Control	53.77	4.31	2.	.31	33.41	.58**
Social functioning	Pain	37.97	9.98	1.	.07	4.99	.26*
	Control	54.57	4.95	2.	.46	69.81	.71**
Energy/fatigue	Pain	40.72	9.19	1.	.00	0.02	.02
	Control	51.66	9.68	2.	.27	26.28	.54**
Brief Symptom Inventory							
Obsessive-compulsive	Pain	63.41	8.72	1.	.02	1.64	-.15
	Control	53.71	7.61	2.	.24	23.22	-.51**
Internal sensitivity	Pain	57.59	10.01	1.	.04	2.92	-.20*
	Control	47.40	10.22	2.	.17	15.72	-.43**
Psychoticism	Pain	62.18	9.21	1.	.07	5.10	-.26*
	Control	51.11	7.31	2.	.26	26.93	-.53**
Somatization	Pain	61.69	9.54	1.	.15	12.48	-.38**
	Control	48.03	5.61	2.	.33	45.54	-.60**
Depression	Pain	59.54	7.63	1.	.04	3.01	-.20
	Control	48.57	6.36	2.	.34	39.63	-.61**
Paranoid Ideation	Pain	59.26	9.80	1.	.10	7.60	-.31*
	Control	50.60	7.13	2.	.15	13.91	-.40**
Anxiety	Pain	57.59	9.62	1.	.12	10.16	-.35*
	Control	46.26	7.73	2.	.22	24.17	-.50**
Phobic Anxiety	Pain	56.08	11.31	1.	.15	12.36	-.38**
	Control	46.46	5.01	2.	.16	15.73	-.41**
Hostility	Pain	61.31	7.02	1.	.00	.28	-.06
	Control	53.26	8.68	2.	.21	19.20	-.48**

note: $n = 39$ (maternal chronic pain group), $n = 35$ (control group); *$p < .05$; **$p < .001$

Table 2.4 Maternal differences in psychosocial variables

	Descriptive Data			Regressions			
	Group	Mean	SD		R^2 change	F change (df) (1,72; 1,71)	ß
Social Support							
Number of supports	Pain	2.89	1.67	1.	.13	10.28	.37*
	Control	4.03	1.93	2.	.04	3.48	.22*
Quality of supports	Pain	4.61	1.06	1.	.20	16.69	.45**
	Control	5.34	.44	2.	.08	7.37	.30*
Coping							
Problem-focused	Pain	28.05	6.87	1.	.01	.53	-.09
	Control	22.61	12.48	2.	.07	4.65	-.27*
Seeks social support	Pain	12.10	3.22	1.	.01	.82	-.11
	Control	8.77	5.16	2.	.13	9.67	-.37*
Blames self	Pain	3.92	2.76	1.	.00	.20	-.05
	Control	3.35	2.51	2.	.01	.62	-.10
Wishful thinking	Pain	14.16	5.69	1.	.03	2.12	-.18
	Control	9.00	6.34	2.	.13	10.49	-.38**
Avoidance	Pain	15.84	5.12	1.	.02	1.54	-.15
	Control	9.61	6.50	2.	.21	17.66	-.47**
Family Environment							
Cohesion	Pain	49.26	18.36	1.	.10	7.25	.31
	Control	58.90	9.33	2.	.05	4.20	.24*
Expressiveness	Pain	48.58	14.47	1.	.02	1.26	.14
	Control	57.55	9.56	2.	.10	7.44	.33*
Conflict	Pain	50.52	10.00	1.	.02	1.25	-.14
	Control	44.16	9.99	2.	.08	5.78	-.29*
Independence	Pain	48.05	11.57	1.	.02	1.27	.14
	Control	47.03	11.73	2.	.01	.48	-.09
Achievement orientation	Pain	44.58	12.30	1.	.01	.33	.07
	Control	43.32	11.80	2.	.01	.37	-.08
Intellectual/cultural orientation	Pain	53.11	13.17	1.	.04	2.55	.19
	Control	55.19	10.29	2.	.00	.10	.04
Active/ recreational orientation	Pain	46.61	11.81	1.	.05	3.62	.23
	Control	55.45	10.14	2.	.11	8.22	.34*
Moral religious emphasis	Pain	49.71	12.63	1.	.02	1.04	-.12
	Control	50.77	11.83	2.	.01	.44	.08
Organization	Pain	53.89	12.21	1.	.00	.00	.01
	Control	56.10	11.51	2.	.01	.60	.10
Control	Pain	57.39	8.87	1.	.04	2.95	-.21
	Control	51.61	10.53	2.	.06	4.34	-.25*
Parenting							
Parenting Tasks	Pain	33.64	13.31	1.	.16	12.97	-.40*
	Control	10.84	11.76	2.	.34	45.32	-.61**

note $n = 38$ (chronic pain group); $n = 31$ (control group);*$p < .05$; **$p < .001$

2.3.2 Controlling for Mental Health

A hierarchical regression analysis was run to control for the possibility that differences in mental health explain the chronic pain mothers' level of psychosocial functioning. To control for the impact of mental health, the BSI composite score was entered at step 1. The composite scores for problem-focused coping, emotion-focused coping, social support, as well as the factors contributing to the relationship dimension of the FES, were entered at step 2. As past research indicates that the cohesion, expressiveness and conflict scales of the FES play a substantial role in terms of affecting the family dynamics of a chronic pain patient (Dura & Beck, 1988; Romano et al., 1997), these were included.

Table 2.5 The impact of psychosocial factors on the physical functioning of chronic pain mothers after accounting for mental health

Dependent Variable	*Step*	*R^2 change*	*F change (df):*	*ß*
Physical Health Composite	1. BSI Composite	.14	5.66 (1, 36)	-.37*
	2. Psychosocial Variables:	.33	3.04 (6, 30)	
	Problem coping			.40*
	Emotion coping			-.47*
	Social Support			-.23t
	Cohesion			.08
	Expressiveness			.09
	Conflict			-.39*
	Parenting			.24t

note: * $p < .05$; t $p < .10$

After accounting for the effects of mental health, a number of psychosocial variables explained unique variance in the mother's physical health scores. Problem-focused coping was positively related to physical health, while emotion-focused coping was negatively related. Using strategies to influence the pain is related to increased

physical functioning. Passive methods (such as avoiding pain and wishful thinking) are associated with less adaptive physical functioning. Family conflict was also significantly related, with more conflict related to decreased physical functioning in mothers.

The measures entered in the regression accounted for a substantial amount of the variance in physical health scores. Mental health scores accounted for 14% of the variance [R^2 change = .14, $p < .05$]. The additional psychosocial factors accounted for another 33% of the variance [R^2 change = .33, $p < .05$]. Together, psychological functioning (depression, anxiety and other mental health issues) along with psychosocial variables (parenting, coping, social support, and family dynamics) accounts for almost 50% of the quality of mother's physical health.

2.3.3 Parenting

To determine which variables were associated with compromised parenting in the chronic pain group, a simultaneous regression examining the contribution of the mother's physical health, mental health, social support and coping, was performed.

Table 2.6 Predictors of parenting for mothers with chronic pain

Dependent Variable	*Independent Variables*	R^2	*F Change (df):*	*ß*
Parenting		.29	2.55 (5, 32)*	
	Mental Health			.44*
	Physical Functioning			-.28 ŧ
	Social Support			-.05
	Emotion Coping			-.21
	Problem Coping			.20

note: * $p<.05$; ŧ $p<.10$

Together, the predictors were significant and accounted for 29% of the variance of parenting scores [$R^2 = .29$, F change = 2.55, $p < .05$]. The analyses revealed that only mother's mental health scores were significantly associated with parenting scores [$\beta = .44, p < .05$]. High levels of psychological distress in mothers with chronic pain contribute towards problems with parenting tasks.

2.4 DISCUSSION

The findings support the first hypothesis that mothers with chronic pain display differences in psychosocial functioning relative to controls. This was the case even after accounting for disparate income levels between the groups. Mothers with chronic pain reported decreased physical health (including pain and illness behaviour) as well as psychological difficulties, such as less adaptive coping and social support, family dysfunction and reduced capacity to engage in basic parenting tasks. Apart from the parenting difficulty (for which there is limited precedent), the functioning of mothers in the chronic pain group is consistent with that shown previously (Faucett & Levine, 1991; Feuerstein et al., 1985; Guthrie, 1996; Katon, & Sullivan, 1990; Klapow et al., 1995; Romano et al., 1997). These findings provide further evidence of the presence of psychosocial variables in the experience of chronic pain. They show that children living with maternal chronic pain may be at risk through an exposure to the mother's reduced psychosocial functioning and reduced parenting efficacy.

As predicted in hypothesis two, a range of psychosocial variables were associated with maternal chronic pain after controlling for mental health. The chronic pain group used higher levels of both problem-focused coping (to influence the pain), and less adaptive emotion-focused strategies (including wishful thinking and avoidance). Emotion-focused coping was related to decreased mental health, while

problem-focused coping was related to increased mental health. This is consistent with the literature linking active or problem-focused strategies with positive outcomes among patients with chronic illness (Newman et al., 1990), and emotion-focused strategies with poorer outcomes (Bombardier et al., 1990; Jensen et al., 1991).

Family conflict emerged as a significant predictor of physical health in the mother (after controlling for mental health), emphasising the importance of the family in the experience of chronic pain. Not only is the mother's state likely to impact on other family members around her, but also the amount of hostility and conflict displayed by family members impacts on the mother's functioning in a very direct and physical way. With regard to the general family environment, chronic pain mothers report less cohesion (Dura & Beck, 1988; Naidoo & Pillay, 1994; Romano et al., 1997), and greater conflict (Dura & Beck, 1988; Feurstein et al., 1985; Naidoo & Pillay, 1994), less expressiveness and active-recreational orientation (Kopp et al., 1995), as well as more frequent use of control (Feurstein, et al., 1985; Romano et al.,1997). This shows an environment with little commitment and support, discouragement to act openly and express feelings, aggression and conflict amongst family members, and less social and recreational activities. Such an unresponsive environment is a stressor for sufferers of chronic pain and for their children.

Mothers with chronic pain reported decreased support from others and reduced satisfaction with the assistance received. This confirms previous research suggesting that individuals with a chronic disease experience less satisfaction with support than do healthy individuals (Schreurs & de Ridder, 1997). This is perhaps because they come to rely on others, who invariably do not live up to their expectation of support. Again, a sense of exclusion, loneliness and reduced social contact in the mother is likely to resound throughout the family, and find its mark on the children. Research has suggested the importance of mother's social support to children's functioning, with

higher levels of support positively correlated with young children's competence (Pianta & Ball, 1993). Social support becomes even more important to mothers and children under stress.

The results related to hypothesis two elucidate the variables involved in a mother's positive adaptation to chronic physical pain. Taken together, the tested psychosocial variables explained nearly half of the variance in physical health scores of mothers with chronic pain. A patient in good mental health, who actively attempts to do something about their pain, focuses less on the emotional aspects of the pain (by facing up to difficulties), and is surrounded by a harmonious family, is likely to experience an associated increase in physical well-being and less pain. The findings provide firm support for the involvement of psychological and social processes in the experience of pain and apparently 'physical' manifestations of health. The findings suggest ways for parents to mitigate the impact of their health on children. It is likely that positive variables impact in a similarly positive manner on children.

Hypothesis 3 examined the factors contributing to parenting efficacy. Mental health emerged as the variable of greatest significance. The mother's mental health issues were related to parenting task efficacy, such that mothers with compromised psychological adjustment were more likely to experience problems with parenting. This is supported by a vast body of literature documenting the role of depression and other forms of mental distress in a parent's ability to extend a high level of care and discipline to children (Dutra et al., 2000; Goodman & Gotlieb, 1999; Downey & Coyne, 1990). This result provides valuable information about the manner in which the parenting demands of mothers with chronic pain may be partly alleviated. Steps to address the mental functioning of mothers with chronic pain will accomplish the dual benefit of increasing the mother's capacity and confidence to deal with parenting demands, as well as the child's quality of parental care.

Despite these findings, the knowledge of a mother's parenting while in chronic pain remains rudimentary. More research is required regarding the specific aspects of parenting compromised in mothers experiencing chronic pain. Ineffective parenting appears to operate in specific ways in other areas of parental stress (such as parental divorce, unemployment and depression) (Forgatch et al., 1988; McLoyd, 1990). Situations of stress may lead to parents engaging in increased punitive measures as well as diminished positivity including affection and involvement (Downey & Coyne, 1990). Chronic pain may lead to similar kinds of specific disruptions to effective parenting. Although the current study is supported by the literature pointing to reduced efficacy of parenting as an important variable in situations of stress, how this occurs in chronic pain is yet to be elucidated.

There are some limitations in this study. A larger sample size would strengthen the findings, particularly in the regression analyses, where more predictors may have emerged. Other predictors could also be examined, such as the range of family environment variables. The potential differences that may exist when mothers, as opposed to fathers, experience chronic pain may limit the extrapolation of these findings. Future studies need to address the plight of fathers with chronic pain, and to contrast the parenting demands of mothers, as opposed to fathers, in chronic pain. This study does not address the precise interaction mechanisms of the psychosocial variables examined. Further research is required to trace how differences in mental heath, coping, social support and family environment contribute toward the severity and duration of chronic pain conditions. Longitudinal tracking of pain, from onset to chronicity together with an analysis of accompanying psychosocial influences is needed to determine the continuum from acute to chronic pain. Relevant psychological issues could then be targeted in measures to prevent the onset of chronic pain.

The results of this study still underscore the role of psychosocial processes in the experience of mothers with chronic pain. The results also highlight the presence of parenting problems associated with chronic pain. Differences between the functioning of mothers with chronic pain and healthy mothers demonstrate that the mother's experience of chronic pain poses a risk to their children. Children and other family members are likely to be exposed to the same stressors as mothers in pain. Like the impact of marital conflict and maternal depression (Cummings & Davies, 1993; Downey & Coyne, 1990; Goodman & Gotlieb, 1999), the effects of pain are likely to reverberate throughout the family.

In order to determine whether this is really the case, the next study involved comparing the functioning of children living with maternal chronic pain with the functioning of control children living with healthy mothers. This should provide the clearest indication of whether children are negatively affected as a result of maternal chronic pain.

CHAPTER 3

PSYCHOSOCIAL ADJUSTMENT AND PHYSICAL HEALTH OF CHILDREN LIVING WITH MATERNAL CHRONIC PAIN[2]

3.1 INTRODUCTION

Most parents contend with occasional illness and pain. The changes to which a family must accommodate for an episode of the flu or acute back pain, may present certain challenges to family functioning. These are challenges unlikely to disrupt the long-term stability of the family environment. In contrast, *chronic* illness and pain present a more serious source of stress for the parent and for the family. A chronic physical condition may remain indefinitely and have no cure (Burish & Bradley, 1983; Stuifbergen, 1990). Its impact often becomes a life-long burden for the patient, with the condition potentially affecting other family members, including the children of sufferers (Armistead, Klein, & Forehand, 1995; Kahle & Jones, 1999).

The repercussions of parental physical impairment for children remain largely unexplored. Empirical examination is needed, as several reviews of the small number of existing studies have noted (e.g., Armistead, Klein, & Forehand, 1995; Kahle & Jones, 1991; Korneluk & Lee, 1998). The lack of research is surprising given that a range of chronic conditions -- including migraine, arthritis, and chronic neck and back pain -- affect people in their child-rearing years. Estimates from the USA place the number of people suffering from chronic pain as high as one in three, with some 86 million people suffering chronic pain (American Chronic Pain Association, 2001).

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Recent Australian estimates suggest a more conservative figure of one in five people (Blyth et al., 2001), with adults in their 40's more likely to report extremely high levels of interference in daily life tasks associated with pain. The trend in delayed child-bearing in most Western nations makes it likely that a large proportion of patients are responsible for young or teenage children.

The current tendency to minimise hospitalisation means that parental illness and pain have moved from the medical to the family arena, with children being exposed to a sick parent in the home environment. There is an associated emphasis in medicine to use the family and children to help patients manage their condition (Burish & Bradley, 1983). As a result, the child may be raised by a debilitated parent, or in some cases, be required to 'parent' the parent at times. Similar to parental stressors such as marital discord (e.g., Anderson & Sabatelli, 2003), the demands associated with parental chronic pain seem likely affect the entire family.

Interfering pain compounds the routine challenges facing any caregiver. Sufferers report difficulties in family tasks, such as physical play, cleaning and cooking, and picking up and hugging children that most parents take for granted (Armistead, Klein & Forehand, 1995). Parental chronic pain may restrict the child's ability to engage in age-appropriate behaviour and social activities for extended periods of time, as the family's primary focus is attending to the ill parent. This redirection of the family's resources and time carries risks of reduced supervision, attention, and affection for the child. Emotional unavailability, hostility, depression, and anger often colour the sufferer's interactions with others (Diener, van Schayck, & Kastrup, 1995), creating further risks for children. Given the association between maternal depression and negative child outcomes (Goodman & Gotlieb, 1999), the effects of maternal chronic pain on children seem profound.

The stressors of parental chronic pain may impact broadly on children's physical and psychosocial development. Children may worry about their parent's health and unavailability, with the development of internalizing problems (such as anxiety and depression), and externalizing behaviour (such as aggression) (Chun, Turner, & Romano, 1993; Mikail & von Baeyer, 1990; Rickard, 1988). Insecure attachment in the child may eventuate, given the importance of the caregiver's physical and emotional presence in the development of a secure attachment relationship (Goldberg, Grusec & Jenkins, 1999; Hurt & Ray, 1985), and the potential for chronic pain to reduce a parent's availability. A more direct effect of parental chronic pain may be an association between pain in the parent and a range of similar health and somatic complaints in the child. These may be brought about through modelling or social learning processes (e.g., Jamison & Walker, 1992).

Despite a plethora of potential negative consequences for children exposed to a physically-impaired parent, children may remain relatively unaffected. Consistent with the idea that development involves gains and losses (Baltes, 1987) parental chronic pain could mean both advantages and disadvantages for children. Physically debilitating conditions in a parent can 'make' the child by facilitating growth and independence. Such diverging developmental trajectories are found in parental AIDS and cancer (Armistead & Forehand, 1995; Baider, Cooper & De-Nour, 1996). Parents with cancer may greatly appreciate the time they have left with their children, attach a high value to their role as a parent, and provide a harmonious and warm environment for children. All may lead to positive outcomes for their children. However, chronic painful conditions affecting quality of life but without the terminal repercussions of AIDS or cancer, may not propel parents into a similar re-evaluation of their relationships. Frustration is a more common reaction, as debilitating chronic pain often follows the sufferer over their natural life-span, with attempts to escape the pain

repeatedly thwarted (Aldrich, Eccleston, & Crombex, 2000). The positive consequences of parental illness may not be associated with an extended or indefinite course of illness or pain (Doherty & Campbell, 1988).

The demands of the chronic pain sufferer are distinct from those with acute pain or a terminal illness. Although 'chronic pain' conditions cover a number of conditions, they represent a fairly unitary classification. Conditions such as arthritis and chronic back pain involve different sources of pain, but they share a great deal in terms of patient functioning (Anderson & Rehm, 1984). Chronic painful conditions are similar in the sense that pain often presents an unexplainable, unpredictable, and ongoing source of stress (Roy, 2001). Children are exposed to overt suffering in their parent for extended periods, with the reactive responses of both parent and child becoming a stable pattern of behaviour.

The empirical research that does exist is revealing, with several studies associating problem behaviour in children with parental chronic pain. One such problem behaviour is somatization. In a study of 17 pain patients, Chaturvedi and Kanakalatha (1989) found six children (33%) to experience pain in a site *identical* to that of their parents, suggesting that children experience their distress in a physical manner, and use their parent's complaints as cues. In a study of 24 pain patient-child dyads, Mikail and von Baeyer (1990) found children to be significantly more likely to be somatically focused or concerned with their health than control children. Furthermore, Jamison and Walker (1992) found children of parents with chronic pain more likely to report abdominal pain and to use more medication than children of parents without pain.

Children living with parental chronic pain have also been documented to suffer from internalizing disorders like anxiety and depression (Dura & Beck, 1988).

Externalizing behaviour or conduct problems, such as delinquency, are reported in children of chronic pain parents (Chun, Turner, & Romano, 1993; Rickard, 1988). Self-esteem may be compromised as well. In a sample of 16 children of parents suffering from chronic arthritis, Hirsch, Moos, and Reischl (1985) found self-esteem to be lower in the parental pain group when compared to control children. Not all studies, however, point to negative outcomes. In a study of 31 children living with parental chronic pain, only 3 were found to be 'vulnerable' on a number of psychological measures (Roy et al., 1994), although the small sample size and lack of a control group make these findings uncertain.

The balance of empirical evidence indicates that children of chronic pain parents are at increased risk of health and psychosocial dysfunction. These conclusions remain tentative due to a range of limitations (Armistead, Klein, & Forehand, 1995). Sample sizes are small (16-40 children) and few studies used a control group. Attempts to look at a range of children's behaviour are limited, and examinations of psychosocial functioning and physical health together are rare. Important outcomes such as the child's attachment to the parent, social skills, and general psychological and physical health, remain unexplored. Although studies have found children to be at increased risk of some dysfunction, the number of children suffering from *clinical* symptomology has been ignored. It is imperative to obtain such data in order to understand the severity of children's problems.

Developmental principles have been largely neglected in examinations of the effects of parental chronic pain on children (Finney & Miller, 1999). Most studies have included children within a wide age-range (5 to 18 years). Such a range may bypass relevant developmental changes in which children may be at increased risk. Younger children may be particularly vulnerable to the effects of parental chronic

pain. Older children are buffered somewhat from stressors, through matured coping and behavioural systems (Sroufe & Rutter, 1984). Gender differences may also exist, yet remain largely unexplored. Similar to studies into marital discord, maternal depression and divorce (Emery & O'Leary, 1982; Hetherington, 1989), girls may be less reactive to stressors such as maternal chronic pain, particularly with reference to externalizing behaviour (Fergusson & Horwood, 2003).

Whether a mother or a father is affected by pain may impact on the child's adjustment (Armistead, Klein & Forehand, 1995). Children may react differently to pain in a father as compared to a mother. It is essential to examine the effects of maternal and paternal chronic pain independently. The present research focus is on *maternal* chronic pain as women are more likely to be affected by chronic pain (Blyth et al., 2001; Robinson, Wise, & Riley, 1998) resulting in compromised functioning (Sheffer et al., 2002). The high representation of mothers as primary caregivers also makes the impact of parental chronic pain particularly pertinent to mothers.

Fathers were still involved in the present study, by providing their view of children's behavior. Children often behave differently across contexts (at home, school, or with peers), and it is important to gather reports from a number of sources, including mother, fathers and children themselves. Parents with chronic pain do not always provide an accurate picture of their children's health and general functioning. Parents may report problems consistent with their own (Mikail & von Baeyer, 1990), highlighting the importance of multiple informant information including fathers.

There has been mention in review and theoretical papers as to the underlying mechanisms that may explain the impact of parental chronic pain (Armistead, Klein & Forehand, 1995; Korneluk & Lee, 1998). These studies provide valuable insights, yet such insights may be premature. The primary issue is to establish whether chronic

pain presents risk, by examining the functioning of children with parents in chronic pain in relation to controls. First, comparisons between children in a potentially stressful environment and control children are needed to document whether differences exist Only then can mechanisms be understood (Downey & Coyne, 1990).

In the current study, differences are examined between children of mothers suffering from chronic pain and control children of healthy mothers on a range of psychosocial and health indicator variables. These data were based on reports from children, mothers, fathers, and teachers. It was firstly hypothesized that when compared to controls, children of mothers with chronic pain are more likely to experience increased levels of physical health problems (such as pain and illness behaviour) and decreased levels of psychosocial adjustment. This includes internalizing behaviour (depression and anxiety), externalizing behaviour (aggression and social problems), and compromised attachment security. Given evidence suggesting gender differences in reactions to adversity, it was secondly hypothesized that boys are at increased risk compared to girls, particularly with reference to externalizing and social difficulty. It was thirdly hypothesised that maternal chronic pain poses a direct risk factor, with characteristics such as increased pain persistence, duration, and severity relating to child dysfunction.

3.2 METHOD

3.2.1 Participants

The target group consisted of 55 children (25 females, 30 males) of mothers with chronic pain. Forty-eight control children (20 females, 28 males) of healthy mothers served as controls. The children ranged between 6 and 12 years of age (M = 8.7

years; SD = 1.91), with the mean age of children in the chronic pain group being 8 years and 10 months (SD = 1.97), and for the control group- 8 years and 4 months (SD = 1.82). Results revealed no significant differences between children's age [t (101) = 1.29, $p > .05$] or sex [χ^2 (1) = .15, $p > .05$] across the groups.

Mothers in the chronic pain and control groups were recruited via advertising in local newspapers and via notices in doctors' offices. Approximately equal numbers of mothers in each group responded to each of the advertising methods. Apart from income level, the groups did not significantly differ on a range of demographic differences including ethnicity, maternal employment and marital status, as well as child age and number of children in the home (Evans, Shipton & Keenan, 2004). Chronic pain group mothers experienced a variety of conditions, including chronic back pain, migraine, arthritis, endometriosis and chronic fatigue syndrome. All met inclusion criteria for chronic pain, experiencing recurrent or persistent pain for 6 months or more. The duration of conditions ranged from 1 year to 45 years, with an average of 11.2 years (SD = 8.49). Mothers rated their pain as considerable, with the mean rating of pain severity being 2.31 on a scale of 1 (mild) to 3 (severe). Over 70% of mothers experienced pain on a daily basis and used medication regularly

3.2.2 Procedure

Mothers were initially screened by telephone to ensure they experienced chronic pain, or for the control group, were in good health. Mothers in both groups were told that the study would look at the effects of health in the family on children. The study's hypotheses were not revealed. The age range of children was limited to primary school children between 6-12 years of age due to the increase in vulnerability to risk this age group represents (Sroufe & Rutter, 1984).

Families were visited in their own homes, where a consent form (for both mothers and children), and a battery of questionnaires were given. Questionnaires were read out to children, but they completed the items themselves. Any unknown words were explained in a consistent manner to the children. At the same time, the mothers completed a range of questionnaires regarding their own functioning and their child's functioning. Another copy was left to be filled in by fathers of children, and to be returned in the envelope provided. Where applicable, the questionnaire was completed by a step-parent. In the maternal chronic pain group, 34 of the returned 42 questionnaires (81%) were completed by the biological fathers. Thirty-three of the returned 39 questionnaires (85%) for the control group were completed by the biological father. Families were given a $10 grocery voucher as appreciation for their participation.

Consent was obtained from parents to make contact with the child's teacher in order to provide information about the child's behaviour at school. Five mothers in the chronic pain group, and 3 in the control group refused permission. Reasons given included placing demands on the teacher or due to problems with the teacher. Where permission was granted, teachers were sent an information sheet with a number of questionnaires. Teachers remained blind to group status, and were unaware of the research purposes. There were no significant differences between groups in the number of teachers who failed to return questionnaires [χ^2 (1) = .00, $p > .05$], or in the number of fathers who failed to return questionnaires [χ^2 (1) = .53, $p > .05$].

3.2.3 Measures

Background Information Questionnaire: Mothers first completed a brief questionnaire regarding demographic information (number and ages of children, maternal age, marital and employment status). Socioeconomic status (SES) variables were also

included; the mother/partner's highest level of education was rated on a scale from 8 (no formal education) to 1 (postgraduate degree) and total family income from 1 (less than $5000) to 9 ($100 000 or more). Using income to measure SES is consistent with methods used elsewhere (Matthews et al., 2000; Wister, 1996). Questions pertaining to chronic pain such as pain persistence (versus intermittent pain), and length and severity of pain, were included.

Mother/Father/Teacher Reports

Child Behaviour Checklist: Mothers and fathers, where applicable, completed the Child Behavior Checklist (CBCL) and teachers the Teacher Report Form (TRF), the classroom equivalent of the CBCL. These are widely used rating scales of children's behaviour (Achenbach, 1991), and measure the following:- withdrawal, somatic complaints and anxious/depressed behaviour (comprising the internalizing dimension); delinquency and aggression (comprising the externalizing dimension); and three additional constructs (social problems, thought problems, and attention problems). The CBCL and TRF have demonstrated reliability, validity and short and long-tem stability (Achenbach, 1991). The TRF includes a scale regarding happiness.

Perceived Competence Scale for Children: The social skills subscale was employed as adapted from Harter (1979). It involves four diametrically opposed statements (e.g., 'this child usually acts appropriately' versus 'this child usually does not act appropriately'). Parents and teachers are asked to select one of the two statements and to indicate whether it is 'sort of true' or 'really true.' Scores for each statement range from 0 to 4, with higher scores denoting increased behaviour consistent with social conventions. The scale has acceptable psychometric properties of internal consistency, test-retest reliability, and factorial and construct validity (Harter, 1982).

Child Health Questionnaire: Mothers completed items regarding children's quality of sleep, eating patters, the number of medical conditions experienced, and a measure of general health. This includes items such as the frequency of stomach aches or pains not explained by a medical cause. Higher scores indicate increased health problems. Teachers provided information about children's health in the classroom. Items include the number of days absent (due to ill health) as a percentage of overall days absent, the frequency of pain or illness complaints in the classroom, and the frequency of visits to the nurse/sick bay (see Appendix A2).

Child Self Reports

Child Depression Inventory: The CDI (Kovacs, 1992) is a widely used measure of children's depressive symptoms. Although originally designed for children aged 7 to 17 years, it has been successfully used with children as young as 6 years of age (Deblinger, McLeer, & Henry, 1990; Koverola et al., 1993; Jensen et al., 1990). The inventory includes items in contexts relevant to children (e.g., school), requires the lowest reading level of any depression measure for children, and has acceptable reliability and validity (Helsel & Matson, 1984; Romano & Nelson, 1988).

Revised Child Manifest Anxiety Scale: The RCMAS (Reynolds & Richmond, 1978) is a 37-item scale validated for use with children aged 6 to 19 years (Lee et al., 1998). The format is true/false and has acceptable test-retest reliability, internal consistency (Reynolds & Paget, 1983), and discriminant validity (Volpe & Du Paul, 2001).

Aggression Scale: This measure was adapted from the Youth Self-Report Form (Achenbach, 1991), and uses items from the Aggressive Behavior Subscale. The subscale has not been standardized for 6 to 11-year-olds, but has been successfully employed before with children within this age range (Dutra et al., 2000). The scale does not include difficult words or concepts, and has high face validity.

Child Health Questionnaire: This is similar to the mother's version. Items encompass sleeping patterns (e.g., 'how often do you wake up at night?'), eating patterns (e.g., 'how often do you not feel hungry at meal times?'), general health ('how often do you feel sick or sore?') by using a scale of 0 (never) to 4 (every-day) The last dimension refers to general illness behaviour with two questions about frequency of doctor and sickbay (school nurse) visits. Higher scores denote increased levels of health compromising behaviour or illness/pain.

Separation Anxiety Test: The SAT is a semi-projective test of children's attachment security to their primary caregiver (Klagbrun & Bowlby, 1976). A scoring system devised by Slough, Goyette, and Greenberg (1988) is employed. Children are shown photographs depicting various scenes of separation between a child and parent. Two versions that are developmentally sensitive are used, with scenes appropriate for children aged 5-7 years and 8-12 years. The photographs reveal scenes of severe separation (e.g., parents away for the weekend) as well as mild separation (e.g., bed time). An overall attachment score, accounting for children's attachment security, self-reliance and inverse avoidance, is computed. Higher scores indicate secure attachment. Moderately high correlations with attachment ratings taken from separation-reunion situations consistent with the strange situation have been demonstrated (Shouldice & Stevenson-Hinde, 1992; Main, Kaplan, & Cassidy, 1985). Acceptable inter-rater reliability has also been reported (Wright, Binney, & Smith, 1995).

3.3 RESULTS

Apart from a significant difference on income level [t (72) = -2.29, $p < .05$], no other differences were found between the chronic pain and control families (Evans, Shipton

& Keenan, 2004). To control for disparate income levels, analyses that examined group differences were performed using hierarchical multiple regression analyses with income entered at Step 1.

3.3.1 Child self-reports

Table 3.1 presents means, standard deviations and ranges for children's scores on the following: Child Depression Inventory (CDI); Revised Child Manifest Anxiety Scale (RCMAS); Aggression Scale (Agg); Separation Anxiety Test (SAT); and subscales of the Health Questionnaire, including quality of sleep (Sleep), healthy eating behaviour (Eat), frequency of illness/pain (Pain), and frequency of illness behaviour (Ill Beh). Scores for the CDI and RCMAS are shown as t-scores. To the right of Table 3.1 are hierarchical regressions for each child outcome variable, entering income at step 1 and group status at step 2.

Children in the maternal chronic pain group rated themselves significantly higher than control children on the depression [R^2 change = .32, F change = 48.71, $p <$ .001], anxiety [(R^2 change = .33, F change = 49.73, $p < .001$] and aggression scales [R^2 change = .09, F change = 10, $p < .05$], after accounting for income. They rated themselves lower on the SAT [R^2 change = .05, F change = 5.20, $p < .05$], indicating increased insecure attachment.

Children in the maternal chronic pain group scored higher on almost all physical ill-health subscales. In most instances the variance accounted for by group was substantial. For example, group status accounted for an additional 32% of the variance in children's CDI scores, and an additional 33% of the unique variance in children's anxiety scores. This suggests that a large amount of the difference between the groups was due to the presence of maternal chronic pain for some children.

Table 3.1 Descriptive and group difference data for child self-reports

	Descriptive Data				Regressions			
	Group	n	Mean	SD		R^2change	Fchange (df): (1,101; 1,100)	ß
Measure					Step #			
CDI	Pain	55	53.6	9.12	1.	.03	3.13	-.17
	Control	48	42.8	4.9	2.	.32	48.71	-.59**
RCMAS	Pain	55	52.00	8.3	1.	.02	1.85	-.13
	Control	48	41.00	6.9	2.	.33	49.73	-.60**
Agg	Pain	55	11.7	6.39	1.	.02	1.89	-.14
	Control	48	7.83	4.78	2.	.09	10.00	-.31*
SAT	Pain	54	8.01	1.37	1.	.08	8.89	.29*
	Control	47	8.71	.90	2.	.05	5.20	.22*
Sleep	Pain	55	4.02	2.29	1.	.06	6.54	-.25*
	Control	48	3.27	2.29	2.	.01	.94	-.10
Eat	Pain	55	4.52	2.32	1.	.01	1.38	-.12
	Control	48	2.75	1.92	2.	.14	15.85	-.39**
Pain	Pain	55	2.60	.79	1.	.03	2.96	-.17
	Control	48	1.49	.90	2.	.27	39.24	-.55**
Ill beh	Pain	55	3.04	1.21	1.	.04	4.0	-.20*
	Control	48	1.71	1.2	2.	.20	25.91	-.47**

Step 1 = controlling for income; Step 2 = controlling for group status; * $p <$ 05; **$p <$ 01

3.3.2 Mother Reports

Mothers' reports of child functioning were analysed in a similar manner to child reports. Table 3.2 reveals the descriptive data and regression analyses. T- scores accounting for age and gender differences were used for all CBCL scales. In line with children's reports of their own functioning, mothers with chronic pain perceived their children to have decreased social skills, a higher incidence of physical health problems, and a range of internalizing and externalizing behaviour.

Table 3.2 Descriptive and group difference data for maternal reports

	Descriptive Data			Regressions			
	Group	Mean	SD		R^2change	F change (df): (1,101; 1,100)	ß
Measure				Step #			
PCS	Pain	3.33	.61	1.	.10	11.54	.32**
	Control	3.65	.36	2.	.05	5.30	.22*
Sleep	Pain	3.35	2.63	1.	.10	10.73	-.31**
	Control	2.06	2.17	2.	.03	3.44	-.18
Eat	Pain	2.49	1.86	1.	.01	1.19	-.12
	Control	1.75	1.88	2.	.03	3.05	-.18
Medical conditions	Pain	.69	.94	1.	.01	.53	-.07
	Control	.25	.48	2.	.07	7.93	-.28*
General Health	Pain	12.75	5.03	1.	.08	8.75	-.28*
	Control	9.79	4.39	2.	.05	5.85	-.24*
CBCL withdrawn	Pain	57.32	8.12	1.	.12	13.08	-.34**
	Control	52.42	4.1	2.	.07	8.53	-.28*
CBCL Somatic	Pain	60.00	7.9	1.	.08	8.24	-.28**
	Control	54.63	5.7	2.	.09	10.24	-.31**
CBCL anxious/ depressed	Pain	58.80	9.61	1.	.08	8.94	-.29**
	Control	51.97	3.79	2.	.12	15.19	-.37**
CBCL social problems	Pain	57.35	9.77	1.	.03	3.28	-.18
	Control	51.85	4.07	2.	.09	10.27	-.32**
CBCL thought problems	Pain	57.31	7.99	1.	.07	7.78	-.27*
	Control	51.94	4.36	2.	.10	12.09	-.33**
CBCL attention problems	Pain	56.95	9.14	1.	.04	4.09	-.20*
	Control	52.04	4.14	2.	.08	8.62	-.29*
CBCL delin.	Pain	57.76	8.33	1.	.05	5.12	-.22*
	Control	51.67	3.81	2.	.14	17.04	-.39**
CBCL aggression	Pain	56.75	8.55	1.	.13	15.63	-.37**
	Control	51.35	3.79	2.	.08	9.65	-.29*

note: # Step 1 = controlling for income; Step 2 = controlling for group status; n = 55 in pain group; n = 48 in control group;*$p < .05$; **$p < .01$

These findings do not indicate that children experience a *clinical* level of symptomology. To ascertain the severity of children's functioning, the frequency of children experiencing clinical or borderline symptomology (t-score above 65) for the RCMAS, CDI and maternal reports of the CBCL scales was computed for each group. These are presented in table 3.3.

Table 3.3 Prevalence of borderline and clinical behaviour in children.

	Maternal Pain Children t-score > 65	**Control Children** t-score > 65	**Chi Square (df:1)**
Child Reports			
CDI	8 (15%)	0 (0%)	6.57 *
RCMAS	2 (4%)	0 (0%)	1.72
Maternal Reports			
CBCL Withdrawn	10 (18%)	2 (4%)	3.92*
CBCL Somatic	14 (25%)	2 (4%)	6.61*
CBCL Anx/dep	13 (24%)	1 (2%)	7.88*
CBCL Social	13 (24%)	1 (2%)	7.88*
CBCL Thought	13 (24%)	1 (2%)	7.88*
CBCL Attention	12 (22%)	1 (2%)	7.16*
CBCL Delinquency	10 (18%)	1 (2%)	5.71*
CBCL Aggression	6 (11%)	2 (4%)	1.4
CBCL Internalizing	15 (27%)	1 (2%)	9.31*
CBCL Externalizing	9 (16%)	2 (4%)	3.36

note: $n = 55$ in maternal pain group; $n = 48$ in control group;

*significantly different $p < .05$

Many children in the parental chronic pain group showed evidence of clinical level symptoms, as defined by the scales. Somatic complaints, social problems and internalizing behaviour were the most prevalent. Over a quarter (27%) of all children in the parental pain group were rated by their mothers as displaying internalizing behaviour consistent with a borderline or clinical level. The behaviour of the control group was within normal parameters. As seen in Table 3.3, chi-square analyses revealed children in the maternal chronic pain group to be significantly more likely to experience borderline or clinical level problems (t-score greater than 65) on almost every scale as compared to control children. These findings indicate that many children experience extreme levels of internalizing problems in the face of maternal chronic pain. These may require clinical intervention. Children were less likely to rate themselves as being affected to this degree, which underscores the importance of fathers' reports.

3.3.3 Father Reports

Fathers' data revealed increased dysfunction in children living with maternal chronic pain. This verifies the magnitude of children's psychosocial problems. Consistent with child and maternal reports, fathers reported increased child dysfunction in almost every domain. A significant difference between the groups was revealed for all CBCL measures. Unlike maternal reports, social skills measured by the PCS did not appear to be compromised. Yet fathers reported decreased functioning on the CBCL social scale. This may be due to different dimensions being measured by each of the scale's items. The PCS is concerned with children's prosocial behaviour, and may be interpreted in terms of behaviour in the presence of an adult. The CBCL scale provides information about peer interactions. Children in the parental pain group may behave well around other adults, but experience difficulties when relating to peers.

Table 3.4 Descriptive and group difference data for father reports

	Descriptive Data			Regressions			
	Group	Mean	SD		R^2 change	Fchange (df) (1,81; 1,80)	ß
Measure				Step #			
PCS	Pain	3.39	.52	1.	.02	1.17	.12
	Control	3.54	9.54	2.	.02	1.64	.15
CBCL withdrawn	Pain	54.42	6.44	1.	.02	1.38	-.13
	Control	51.56	3.30	2.	.06	5.04	-.25*
CBCL somatic	Pain	56.71	7.38	1.	.06	4.97	-.24*
	Control	52.62	4.50	2.	.07	6.27	-.27*
CBCL anxious/ depressed	Pain	56.69	8.74	1.	.01	.88	-.10
	Control	52.62	5.59	2.	.08	7.11	-.29*
CBCL social problems	Pain	55.87	8.85	1.	.02	1.44	-.13
	Control	52.15	5.10	2.	.05	4.17	-.23*
CBCL thought problems	Pain	55.8	7.05	1.	.00	.30	-.06
	Control	51.60	3.96	2.	.12	10.57	-.35*
CBCL attention problems	Pain	55.71	7.63	1.	.01	.78	-.10
	Control	52.05	4.62	2.	.07	5.94	-.27*
CBCL delinquency	Pain	54.47	6.47	1.	.02	1.27	-.12
	Control	51.67	4.64	2.	.05	4.00	-.22*
CBCL aggression	Pain	54.60	7.59	1.	.00	.19	-.05
	Control	51.56	6.22	2.	.05	3.71	-.22*

note: *n* (chronic pain group) = 42; *n* (control group) = 39; # Step 1 = controlling for income; Step 2 = controlling for group status; * $p < .05$; ** $p < .001$

3.3.4 Teacher reports

To gauge children's functioning outside of the home, teacher reports for parental pain and control children were analysed. Teachers did not rate children in the parental pain group as significantly different from control children on most of the CBCL scales or physical health scales.

The exceptions were the happiness and social scales, with teachers reporting decreased overall happiness [R^2 change = .09, F change = 5.62, $p < .05$] and more social problems [R^2 change = .06, F change = 2.90, $p < .05$] in children of mothers with chronic pain. Lower social skills were also reported for the PCS [R^2 change = .07, F change = 4.14, $p < .05$], indicating problems relating to peers and less 'good' behaviour in the classroom. Teachers also noted significantly more pain complaints in children of chronic pain mothers [R^2 change = .07, F change = 3.83, $p < .05$].

The small number of significant differences on the CBCL may be due to the fact that 33% of the teachers failed to return the questionnaires, thereby creating a lack of statistical power. Nonetheless, children of chronic pain sufferers clearly demonstrated less social skills in the classroom, appeared less happy and displayed increased concerns with their physical functioning.

Table 3.5 Descriptive and group difference data for teacher reports

	Descriptive Data			Regressions			
	Group	Mean	SD		R^2change	Fchange (df): (1,58; 1,57)	ß
Measure				Step #			
PCS	Pain	3.40	.87	1.	.02	1.12	.14
	Control	3.75	.41	2.	.07	4.14	.26*
% Ill health absents	Pain	77.80	31.26	1.	.01	.46	-.09
	Control	65.11	40.14	2.	.03	1.58	-.17
Pain complaints	Pain	1.08	1.06	1.	.01	.62	-.12
	Control	.63	.71	2.	.07	3.83	-.26*
Illness Behaviour	Pain	.88	.82	1.	.02	1.01	.13
	Control	.59	.61	2.	.04	2.34	-.20
CBCL happiness	Pain	48.50	7.6	1.	.01	.47	.09
	Control	53.22	7.48	2.	.09	5.62	.30*
CBCL withdrawn	Pain	52.54	7.03	1.	.00	.03	-.02
	Control	51.78	4.16	2.	.00	.11	-.04
CBCL somatic	Pain	52.90	6.11	1.	.00	.04	.03
	Control	51.47	2.83	2.	.02	1.42	-.16
CBCL anxious/ depressed	Pain	53.64	5.94	1.	.00	.00	-.00
	Control	51.97	3.51	2.	.03	1.79	-.18
CBCL social problems	Pain	55.14	7.80	1.	.00	.11	-.04
	Control	52.31	4.66	2.	.06	2.90	-.23*
CBCL thought problems	Pain	52.18	11.41	1.	.00	.02	.02
	Control	51.78	3.92	2.	.01	.28	-.07
CBCL attention problems	Pain	53.43	6.21	1.	.05	3.06	-.22
	Control	51.41	3.71	2.	.03	2.14	-.19
CBCL delinquency	Pain	51.75	3.18	1.	.03	1.64	.17
	Control	51.94	4.0	2.	.00	.01	.02
CBCL aggression	Pain	52.19	3.75	1.	.01	.68	-.19
	Control	51.94	4.12	2.	.00	.03	-.02

note: *n* (teachers who returned questionnaires) = 28 in chronic pain group, *n* (control group) = 32;* $p < .05$

3.3.5 Cross-Informant Agreement

In order to determine the concordance between mother, father, and teacher reports of children's behaviour, correlations were conducted for each report on the CBCL scales. As seen in Table 3.6, mothers and fathers in the maternal chronic pain group agreed on children's behaviour, with moderate to high correlations between parent reports for each scale. Teachers' reports were consistent with parent reports for only the somatic, social and attention scales.

Table 3.6 Cross-informant correlations of CBCL scales

	Maternal Chronic Pain Children			**Control Children**		
	Mother/ Father	Mother/ Teacher	Father/ Teacher	Mother/ Father	Mother/ Teacher	Father/ Teacher
Withdrawn	.53**	.33	.28	.20	.03	.07
Somatic	.56**	.37*	.63**	.36*	.22	.26
Anxious/ depressed	.67**	.23	.02	.36*	.01	.38*
Social problems	.84**	.54*	.52*	.50**	.42*	.14
Thought problems	.57**	.09	.03	.50**	.30	.41*
Attention problems	.74**	.56**	.49*	.31*	.18	.05
Delinquency	.66**	.15	.06	.49**	.31	.05
Aggression	.69**	.22	.03	.20	.04	.14

note: * $p < .05$; ** $p < .01$

The associations between different informants for the control group were somewhat lower, although mothers and fathers demonstrated low to moderate agreement on most of the measures. Given that the behaviour of children in the maternal chronic pain group was more extreme, it may have been highly salient to others in the family, and easier to observe and report.

3.3.6 Age and Sex Differences

In order to examine whether any potential age effects existed, t-tests were performed for children in the maternal chronic pain group. Ages were divided into two groups, from 6-8 years, and 9-12 years. Preliminary analyses demonstrated no relevant age effects for child or maternal reports. In contrast to the lack of age effects, a number of significant sex differences emerged and these are presented in Table 3.7.

Table 3.7 Significant sex differences for children in the maternal chronic pain group

	Sex	Mean	SD	t (df)
Child Self-reports				
Aggression	Boys	13.37	6.48	2.15 (53)*
	Girls	9.76	5.80	
RCMAS	Boys	53.73	9.20	2.00 (53)*
	Girls	49.36	6.48	
SAT	Boys	7.57	1.48	-2.67 (52)*
	Girls	8.52	1.05	
Maternal Reports				
CBCL attention	Boys	59.40	10.44	2.26 (53)*
	Girls	54.00	6.30	
PCS	Boys	3.19	.63	-2.00 (53)*
	Girls	3.50	.54	
Health Scale	Boys	21.30	8.01	-2.20 (53)*
	Girls	16.84	6.84	

note: n (boys) = 30, n (girls) = 25; *$p < .05$

The comparisons using t-scores, such as for the CDI, RCMAS and CBCL scales are most revealing, as they control for existing sex differences in the general population. The findings support hypothesis 2, that boys are more adversely affected than girls. Boys reported significantly more aggression [t (53) = 2.15, $p < .05$] and anxiety [t (53) = 2.0, $p < .05$], and less secure attachment [t (52) = -2.67, $p < .05$]. Mother reports indicated significantly more compromised health [t (53) = -2.20, $p < .05$], lower social skills [t (53) = -2.0, $p < .05$] and increased attention problems [t (53) = 2.26, $p < .05$] for boys.

3.3.7 Associations Between Maternal Chronic Pain Indices and Child Functioning

In order to test the third hypothesis that maternal chronic pain is directly related to child functioning, associations between characteristics of the pain condition (episodic versus persistent pain, duration, severity, frequency of pain) and child/ maternal reports of children's behaviour, were analyzed. Zero-order correlations revealed almost no significant associations between maternal chronic pain indices and child outcome. Only the mother's pain severity was significantly related to maternal reported child health [$r = .31, p < .05$] and delinquency [$r = .35, p < .05$].

3.4 DISCUSSION

The findings support the hypothesis that children living with maternal chronic pain experience increased psychosocial and health dysfunction when compared to controls. Reports from children, mothers and fathers were consistent. All point to the existence of internalizing problems (anxiety and depression) and externalizing behaviour (aggression and delinquency), pain complaints, illness-sensitive actions (visiting the doctor), and lower social functioning. Children reported a higher level of insecure

attachment when compared to controls. The results indicate maternal chronic pain to be a source of risk for many children. Its effects on children are pervasive and substantial, impacting on multiple domains of functioning.

The two groups differed on income level with mothers in the chronic pain group reporting significantly less family income than controls. This highlights the well-established relationship between socio-economic status and chronic pain (Adler, et al., 1994). All analyses were therefore conducted controlling for income level. This addresses the possibility that children's lowered functioning in the chronic pain group is due to an increase in the risk of poverty.

The findings support the literature showing that in the face of chronic pain, children are more likely to experience internalizing and externalizing behaviours (Dura & Beck, 1988; Chun et al., 1993; Rickard, 1988) and compromised health (Chaturvedi & Kanakalatha, 1989; Mikail & von Baeyer, 1990; Jamison & Walker, 1992). They also display less social skills and are less securely attached (which may be due to maternal absences such as through hospitalization). This is the first time that such extensive difficulties in comparison to controls have been reported in a single study, and by multiple informants.

Teachers did not report problems as serious as other informants privy to the experiences of children at home. This parallels literature demonstrating moderate to high correlations between similar informants, such as parents, and low correlations between different types of informants, such as parents and teachers (Achenbach, McConaughy & Howell, 1987). Despite these differences, teachers did comment on the presence of social problems, pain complaints and decreased general happiness. Given the consistency in social and health problems reported across informants, children's difficulties may manifest as pervasive socialization and peer interaction issues, and a protracted course of physical pre-occupation and pain. The

inconsistency between home and school reports raises the possibility that children do not display the same strength of compromised behaviour at school as they do at home. Low cross-informant correlations are often explained by children's varying behaviour across contexts (Verhulst & Akkerhuis, 1989). If the mother's pain and related difficulties contribute toward children's compromised psychosocial functioning, and they view this only while at home, children may function more adequately in an environment away from home. Here they do not have to deal with the issues inherent in their mother's pain.

The findings do not indicate an extreme level of maladjustment for all children. Scores were significantly elevated compared to controls, but not all children suffered from clinical levels of dysfunction (at least two standard deviations above the mean). Internalizing dysfunction was the most prevalent, with nearly one quarter of all children in the maternal chronic pain group experiencing levels consistent with clinical dysfunction. The presence of increased general symptoms and some level of clinical internalizing problems warrant attention and concern for these children's future development. It underscores the need for longitudinal research to understand the protracted course of child functioning with parental chronic pain.

Supporting hypothesis two, boys were affected more than girls, showing increased aggression, anxiety and insecure attachment. Their mothers reported attention and social problems as well as decreased physical health. The anxiety and attention findings are the most informative, as these controlled for gender differences in the general population. Although girls are thought to internalize their problems more (e.g., Fergusson & Horwood, 2003; Sheeber, Davis & Hops, 2002), recent research suggests that boys fare worse in situations of stress (Tronick & Weinberg, 2000), and even internalize their problems more than girls. In the pre-teen years of childhood, boys are more vulnerable to a variety of stressors that impact on their

behaviour (Werner & Smith, 2001). Once girls reach puberty and the increase in risk of developing internalizing problems that this age represents, this sex difference may be reduced. Longitudinal research should examine whether such sex disparities with maternal chronic pain continue through to puberty and adulthood.

One reason for the increased level of functioning in girls in this sample is that girls may have been socialised to take on duties to compensate for their mother's debilitation. In many cultures and societies, girls are typically encouraged to adopt a caring and warm style, fitting with a caretaker's role. Boys may accept this role only reluctantly. Boys often rebel against the role of caretaker as such impositions breach common gender role boundaries (Walker, 1999). In families where parents are unable to perform the usual duties and responsibilities of adults, girls become 'parental children' by assuming duties and responsibilities as a consequence of a parent's unavailability (Herer & Mayseless, 2000).

It may be this unavailability of the mother, and other stressors in the home associated with maternal chronic pain, that impact so profoundly on children. There was only limited support for hypothesis 3 that maternal chronic pain is a direct risk factor in the lives of children. Most pain indices failed to significantly correlate with child functioning variables. This is consistent with previous research, showing that objective indices of parental chronic pain and illness are not related to child outcomes (Korneluk & Lee, 1998). The level of parental disability, or the perceived demands of the condition, rather than the level of parental pain, poses the most salient influence in these families (Dura & Beck, 1988). As such, parental chronic pain may represent a more complex stressor that affects and is affected by a number of more specific psychosocial variables. Associated difficulties like psychological distress (Guthrie, 1996), a compromised parent-child relationship and negative family dynamics, may hold more immediate influence than the presence of pain itself (Dutra et al., 2000).

These variables have been elucidated in the maternal depression literature (Downey & Coyne, 1990). It is possible that they apply to other maternal stressors such as chronic pain. Future research should explore whether variables such as parenting, parental psychological adjustment, coping, and family environment can explain the disparities observed between children living with maternal chronic pain and children in pain-free families.

There are a number of limitations in the current study. Firstly, the lack of a longitudinal design limits conclusions regarding children's long-term functioning. This should be addressed in future studies. Secondly, families in the chronic pain group may have exaggerated their problems while control families may have portrayed themselves favourably as they were not blind to their group status. Thirdly, age differences may exist in the functioning of children living with maternal chronic pain. The age range examined here may have been too narrow or there may have been too few children in each age range to detect differences. A comparison of teenage children of sufferers would be a valuable extension to the present study. Fourthly, concrete evidence of children's physical health would be an advantage in understanding the extent of their problems. Access to medical records may clarify whether their complaints have a physical basis and the potential for some kind of genetic transmission of pain susceptibility, or whether children primarily somatize their difficulties to gain attention and in imitation of their parent's complaints. Finally, it may prove worthwhile to control for mothers' psychological functioning along with income in the analyses. According to a biopsychosocial definition of chronic pain, however, a number of processes, including mental health issues, are closely connected to physical functioning (Turk & Flor, 1999). They are so intertwined that partialling out mental health may be an artificial and arbitrary separation of processes.

Despite these limitations, the present study demonstrates the presence of maternal chronic pain to be strongly associated with child dysfunction. Both internalizing behaviour (somatization, anxiety and depression) and externalizing behaviour, (aggression and delinquency) were present. One quarter of children in the maternal chronic pain group were in need of clinical intervention for their internalizing problems. The difficulties did not end there. Social problems, health problems and insecure attachment issues were also more likely to be experienced by children living with maternal chronic pain. Due to the range of these adjustment problems, there is a need for answers to these issues and the reasons why some children show serious adjustment problems. With more knowledge, appropriate interventions can be designed.

Multidisciplinary pain units should target families of chronic pain patients. Warranting special attention are young children of sufferers, whose own suffering is often hidden behind the larger presence of parental chronic pain. Yet these children may ultimately make greater use of public health resources than their parents. The pathway to psychopathology, especially internalizing difficulty such as depression, is often protracted (McCauley et al., 1993). It results in indefinite periods of disability and the heavy use of resources (Roberts, 1999). More alarming is the possible transmission of somatic focus and pain complaints from one generation to another (Edwards et al., 1985; Violon & Giurgea, 1984). Children of patients may themselves become pain patients. The escalating prevalence and cost of chronic pain in the Western world (Breen, 2002), dictates the future need to reduce the number of people debilitated by chronic pain. Intervention may have to start with children of chronic pain patients.

In order to understand *how* maternal chronic pain affects children, the next study addresses the mediators or mechanisms which explain the relationship between chronic pain in a mother and her child's functioning. This provides a means to delineate the variables that identify children at risk in order to halt a protracted course of physical and psychological maladjustment in children.

CHAPTER 4

THE RELATIONSHIP BETWEEN MATERNAL CHRONIC PAIN AND CHILD ADJUSTMENT: THE ROLE OF PARENTING AS A MEDIATOR[3]

4.1 INTRODUCTION

The stressors experienced by a parent are typically not endured alone. Regardless of an individual's best intentions to protect others from his or her own private hardships, stressors inevitably become shared family burdens, that even the youngest family members may experience along with a parent (Rolland, 1988; 1994). Children often witness the distress and suffering experienced by those around them. This is illustrated with respect to maternal depression and marital discord. Children appear to be at increased risk of a range of psychological health issues in the presence of parental discord and mental health issues (e.g., Downey & Coyne, 1990; Goodman & Gotlieb, 1999). Research indicates that maternal chronic pain and illness present a similar threat to the well-being of children. Recently, maternal chronic pain has been paired with a range of negative child outcomes, including child and mother reported internalizing and externalizing behaviour, as well as compromised physical health and attachment security (Evans, Keenan & Shipton, 2004). Earlier studies have provided a basis for illustrating the deleterious effects of maternal chronic pain on children (Chaturvedi & Kanakalatha, 1989; Chun, Turner, & Romano, 1993; Dura & Beck, 1988; Jamison & Walker, 1992; Mikail & von Baeyer, 1990; Rickard, 1988). This

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literature closely parallels the work of Forehand and colleagues (Forehand et al., 1998; Steele, Forehand & Armistead, 1997; Steele et al., 1997), who have examined the effects of parental HIV on children. They found recurring evidence that children experience a range of adjustment issues (including internalizing and externalizing behaviour) when living with an HIV-inflicted parent.

Research into the effects of risk-laden environments has developed with examination of the variables leading from a particular parental stressor to related child outcomes. This mechanistic approach asks what it is about the maternal depression, discord or pain condition, that leaves an associated mark on some children but not others (Rutter, 1987). Knowledge of the risk factors affecting children adversely does not suffice. A more sophisticated level of analysis is needed, where risk can be deflected through knowledge of mechanisms that operate in particular contexts, and particular populations. Such explanatory variables may take many forms. Variables such as the quality of the mother-child interaction (Harnish, Dodge, & Valente, 1995), and a range of maternal and child characteristics, including negative cognitions and coping strategies (Cummings & Davies, 1994, Goodman & Gotlieb, 1999), have provided some understanding of the transmission of parental difficulty to child difficulty.

The aim of this study is to explore some of the proximal explanatory variables in the context of maternal chronic pain. A range of variables may operate within a situation of potential risk. It is possible to define and delineate such factors based on their proximity and significance to children. Distal variables affect children in a global sense, but do not impact on children with the same magnitude as proximal variables. While factors such as social support and parental distress relate to child functioning, these may represent distal factors, as they do not directly involve the child (Dutra et al., 2000). Such variables may be more aligned with the mother, and

operate from the distance of the child's exosystem (Bronfenbrenner, 1986). In contrast, parenting impacts in a more immediate sense on children who live with stressors, as children are directly involved in the process. The strategies used by a parent to guide, discipline and bond with children call on an intimate interplay between both parties. Parenting represents a more immediate, or proximal, level of influence leading from maternal chronic pain. In this study, a range of maternal and family variables are examined in the context of maternal chronic pain. Parenting comprises the proximal variable of primary interest.

A likely question is why only mothers with chronic pain are examined in the study? Although it is noted that understanding the role of paternal chronic pain is important, the sex differences between mothers and fathers with pain are likely to be sufficiently profound so as to warrant a separate examination of each (Armistead, Klein & Forehand, 1995). It may also be argued that the topic relates most pertinently to mothers. Women are likely to suffer more than men in chronic pain conditions such as chronic fatigue syndrome and migraine (Blyth et al., 2001; Robinson, Wise, & Riley, 1998). A woman's functioning in home and work settings may be especially compromised as a result of chronic pain (Sheffer et al., 2002). Simultaneous inclusion of fathers with chronic pain could therefore have confounded the results.

This study presents a number of empirical and theoretical reasons as to why parenting may play a formative role in explaining the impact of maternal chronic pain on children. Firstly, by following a theoretical path from maternal chronic pain to child outcome, a number of associations are evident, with parenting as a mediator. Physical illness, pain or disability not only appear to lead to compromised parenting (Nehring & Cohen, 1995), but also to child dysfunction (Chaturvedi & Kanakalatha, 1989; Chun, Turner, & Romano, 1993; Dura & Beck, 1988; Evans, Keenan & Shipton, 2004; Jamison & Walker, 1992; Mikail & von Baeyer, 1990; Rickard, 1988).

Furthermore, the parenting-child outcome aspect of the equation is supported by a substantial body of literature that reflects a strong link between dysfunctional parenting practices and negative child outcomes. Low parental control and support has long been associated with child behaviour problems (such as internalizing and externalizing behaviour) (Baumrind, 1978; Dishion, 1990; Loeber & Dishion, 1984; Patterson, 1982). Conversely, positive parenting has emerged as a resilience mechanism explaining the adaptive functioning of children in situations of risk (Dutra et al., 2000). The availability of a competent caregiver may be the single most important protective factor for children facing major stressors (Masten, Best & Garmezy, 1990). The notion has its roots in the work of Baumrind (1978), who suggested adequate social adjustment in children to be related to authoritative parenting, characterised by firm parental control, and combined with a warm parent-child relationship. From a risk and resilience perspective, this shows the critical role that parenting plays in the development of children's adaptive and maladaptive functioning.

A second reason that parenting may play a formative role in the link between parental chronic pain and child adjustment is due to its consistent emergence in the empirical risk literature. Parenting is a substantial proximal factor that leads to child resilience or adversity in the context of maternal depression (Cummings & Davies, 1993). There is something unique and potentially dysfunctional about the parenting of mothers with depression. Associated hostility and helplessness create a general lack of warmth and consistency towards the child (Weissman & Paykel, 1974), with mothers confusing their own needs with those of their children (Cohler et al., 1977), and showing less positive emotion (Field et al., 1990).

Indeed, parenting deficits characterize the behaviour of parents experiencing many forms of stress (Downey & Coyne, 1990). These include marital or co-parental

discord, that may affect children through ineffective parenting as a result of parental hostility (Dubow, Roecker, & D'Imperio, 1997; Jones et al., 2003). Family transitions in the form of parental conflict and separation are linked with reduced parent-child relationships and reduced quality of parenting (Pryor & Rodgers, 2001). In some families, the damaged relationships may improve over time. Yet parenting difficulties arising from marital discord often run a protracted course of associated dysfunction and acting-out problems in children (Dunn et al., 1998; Hetherington et al., 1999).

The critical role of parenting has been studied in the parental HIV-illness literature. In families experiencing maternal HIV, the quality of the mother-child relationship and the structure and control exercised by the parent are important factors for positive child outcomes (Kotchick et al., 1997). Parenting in such families appears to have a long-term influence on children's development (Forehand et al., 2002). The actual form of parental stress varies from conditions such as depression to discord to illness. But a remarkably analogous pattern is seen whereby risk is transferred to children via ineffective parenting.

The established link between parental chronic pain and child adjustment dictates a better understanding of the mechanisms underlying the relationship. It is feasible that parenting plays a similar role in the relationship between maternal chronic pain and child adjustment to that seen in maternal depression and marital discord. Maternal coping, social support and the climate of the family environment, are a few variables providing some explanation (Dutra et al., 2000). Given the connection between chronic pain and depression (Diener, van Schayck, & Kastrup, 1995; Katon, & Sullivan, 1990), maternal mental health may also play a role in the relationship between maternal chronic pain and child adjustment. However, in line with previous research on maternal stress (Cummings & Davies, 1993; Dutra, et al., 2000; Kotchick et al., 1997), proximal variables such as parenting may be the

strongest mediator of the association between maternal chronic pain and child outcome. Parenting practices cross the domain of maternal and child variables, as they involve the reciprocal interplay of both parent and child, and directly impact on the child's functioning.

The first hypothesis predicted that physical health and other family/maternal processes (such as the mother's mental health, coping, parenting style and social support) are associated with child psychosocial and physical health. The second hypothesis predicted that the more proximal variable of parenting, is not only associated with child outcome, but also mediates the relationship between mothers' physical functioning and children's adjustment. Such adjustment measures included the child's physical health, internalizing, externalizing and social difficulties.

A number of specific processes underlie the concept of parenting, with certain aspects of parenting to be more or less influential than others. The warmth and quality of the parent-child relationship, and specific dysfunctional parenting behaviour, such as the use of harsh discipline, have been most clearly associated with negative outcomes in children (Dutra et al., 2000). Dysfunctional parenting was therefore measured in a number of specific ways, including the quality of the mother-child relationship, and the use of dysfunctional practices (such as overreacting to child behaviour), laxity in attending to child issues and the use of excessive verbal discipline. It was thirdly hypothesised that, compared to control mothers, mothers in the chronic pain group would employ more dysfunctional parenting strategies (including increased overreactivity, laxness and verbosity) and display less warm and supportive relationships with their children.

The present study used the same sample of participants employed in a previous study of the effects of maternal chronic pain on children (Evans, Keenan & Shipton, 2004). This ensured that the relevant child outcome variables affected by

maternal chronic pain were selected. In the previous study, mother-reported child internalizing, externalizing and social problems, as well as child-reported depression and child and mother reports of child health, were significantly elevated when compared to controls. They were therefore selected for analysis in the present study.

More subjective measures such as demands of the parent's condition have predicted child outcome with greater power than more objective measures, such as condition severity and duration (Evans, Shipton & Keenan, 2004; Korneluk & Lee, 1998; Steele, et al., 1997). Rather than correlating child outcomes with an objective measure of the mother's condition, a measure of the mother's perceived demands of her chronic pain was therefore used to assess the relationship between maternal chronic pain and child adjustment.

4.2 METHOD

4.2.1 Participants

Thirty-nine mothers experiencing chronic pain for longer than 6 months along with their 55 children (25 females; 30 males) aged 6-12-years, served as participants. Thirty-five pain-free mothers formed the control group. The mean age for mothers in the chronic pain group was 37 years (SD = 5.28), and the mean age for the control group 38 years (SD = 5.21). The mean age of children was 8 years and 10 months (SD = 1.97). Participants were recruited by advertising in newspapers and in doctors' offices.

Mothers in the chronic pain group considered themselves to be in good physical health and were free from pain. All mothers in the chronic pain group met the inclusion criteria for chronic pain, namely experiencing recurrent or persistent pain for at least 6 months. The duration of pain ranged from 1 year to 45 years, with an average of 11.2 years (SD = 8.49). Mothers suffered from a range of episodic and

persistent chronic pain conditions that were non-terminal. These included migraine, arthritis, chronic fatigue syndrome and back or neck pain. They rated their pain as considerable, with the mean rating of pain severity 2.31 (SD =0.70) [on a scale of 1 (mild pain) to 3 (severe pain)]. Over 70% of the mothers experienced pain on a daily basis, whereas control group mothers were free from pain.

4.2.2 Procedure

Mothers were screened by telephone to ascertain whether they had experienced episodic or recurrent pain for 6 months or longer. Control mothers were screened to ascertain that they were in good health. Detailed information regarding the sample has been reported elsewhere (Evans, Shipton & Keenan, 2004; Evans, Keenan & Shipton, 2004). Mothers and children completed a battery of questionnaires in their home. Informed consent was obtained from all participants, including children. The children worked through the questionnaires with an independent researcher. To avoid report bias or discomfort in disclosing information, they completed their forms separately from the other members of the family. Due to the number of questionnaires, mothers were left a battery of questionnaires to be completed over the course of one week and returned in an envelope provided.

4.2.3 Measures

Maternal Questionnaires

Background Information Questionnaire: Information such as children's and mothers' age, marital status, and socioeconomic (SES) variables, such as the mother/partner's highest level of education and total family income were included. Items also include pain duration expressed in years since onset, and pain intensity on a scale of 1(mild) to 3 (severe).

RAND-36 Health Status Inventory (RAND-36): Only the physical functioning scale was used in the present analysis. This reflects an individual's reported limitations due to their health. It is closely related to the perceived demands of the pain or illness, that has previously explained why chronic pain appears to impact significantly on sufferers and families (Korneluk & Lee, 1998). Items include problems with work, regular activities and general functioning due to physical health problems. Higher t-scores indicate elevated physical health problems. Acceptable reliability for all the scales (exceeding .90), and convergent and discriminant validity have been reported for the questionnaire (Hays, 1998).

Brief Symptom Inventory (BSI): This is a 53-item self-report inventory designed to assess psychological distress in a range of respondents. The primary symptom dimensions include somatization, obsessive-compulsive behaviour, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. An overall global index that accounts for the above mental health issues was used. Higher t-scores indicate more dysfunction. Adequate reliability and validity have been reported for each scale as well as for the overall BSI scale (Derogatis, 1993).

Ways of Coping Checklist (WCCL): This scale is based on Lazarus and Folkman's (1986) definition of emotion- and problem-focused coping. It comprises six scales. These include problem-focused coping, wishful thinking, social support seeking, avoidance, self-blame, and blame of others (Vitaliano et al., 1985). The scales have acceptable reliability and validity (concurrent and construct). They are aggregated to comprise a problem-focused coping score and an emotion-focused coping score (avoidance, wishful thinking, self-blame). Mothers in the chronic pain group completed the questionnaire with their pain condition in mind. Control mothers did so with respect to a current major problem.

Social Support Questionnaire (SSQ): Mothers reported their perceived number and quality of social support networks (Sarason, Levine, Basham, & Sarason, 1983). The Questionnaire contains 27 items, such as 'Who can you really count on to listen to you when you need to talk?' and 'Who do you feel really appreciates you as a person?' Respondents are asked to list the number of people for whom the question applies. They rate their overall satisfaction with the support received on a scale of 1 (very dissatisfied) to 6 (very satisfied). Acceptable reliability and validity for the scale have been reported (Sarason et al., 1983).

Parenting Scale (PS). The PS identifies three stable factors of dysfunctional discipline styles. These are laxness, overreactivity, and verbosity (Arnold, O'Leary, Wolff, & Acker, 1993). The scale is comprised of 30 items, or 'mistakes' that parents may make. They are paired with their effective counterpart to form the anchors of a 7-point scale. Items measuring laxness include 'When I say my child can't do something, I let my child do it anyway' as opposed to 'I stick to what I said.' The laxness scale has been related to a permissive style of parenting. Items measuring overreactivity include 'I often hold a grudge' as opposed to 'Things get back to normal quickly.' This is consistent with an authoritarian style. Items measuring verbosity include 'I give my child a long lecture' or 'I keep my talks short and to the point,' and are not directly reflective of a particular parenting style. Scoring involved averaging items to create an overall score for each scale. Acceptable reliability (internal consistency and test-retest reliability) and validity have been reported for the scale (Arnold et al., 1993). Higher scores indicate more functional parenting practices.

Interaction Behavior Questionnaire (IBQ): The IBQ consists of 20 dichotomous (True/False) items assessing parent-child relationship quality with reference to communication and conflict behaviour. It assesses the level of support

and warmth in the relationship. Mothers completed the form about their relationship with their child. High scores indicate positive relationships and low scores indicate negative relationships. Acceptable internal consistency and discriminant validity have been reported (Prinz, Foster, Kent, & O'Leary, 1979; Robin & Weiss, 1980).

Child Functioning

Child Depression Inventory (CDI): This is a 27-item self-report to measure children's depressive symptoms (Kovacs, 1992). Items are context-specific, and ask about children's behaviour, feelings and thoughts. The inventory requires the lowest reading level of any depression measure for children. T-scores of 65 or greater are considered to be clinically significant. The CDI is a well-documented measure that possesses adequate reliability and validity (Helsel & Matson, 1984; Romano & Nelson, 1988).

Children's Health Scale (CHS): Mothers and children were asked to report about various aspects of children's health in this questionnaire. Items included quality of sleep, eating patterns, general health (how often they felt sick or sore), and general illness behaviour (frequency of visits to the doctor, sick bay or school nurse). An overall average of mother and child responses for the dimensions was used to denote overall physical health. Higher scores denote increased levels of health compromising behaviour or illness/pain.

Perceived Competence Scale for Children (PCS): Adapted from Harter (1979), this adult-report measures perceived social competence in children. Mothers were asked to rate whether four diametrically opposed statements (e.g., 'this child usually acts appropriately' versus 'this child usually does not act appropriately') were 'sort of true' or 'really true.' Scores for each statement range from 0 to 4, and an average across the four statements is obtained, with higher scores denoting greater social

competence. The scale has moderately high internal consistency, test-retest reliability, factorial validity and construct validity (Harter, 1982).

4.3 RESULTS

4.3.1 Preliminary Analyses

Descriptive data for the sample are shown in Table 4.1. Mean t-scores for mothers on the physical functioning scale are well below two standard deviations, suggesting significant impairment. BSI mean scores are elevated when compared to the general population but below the clinical cut-off of 65. Children's mean scores on the CDI and internalizing and externalizing scales are above average, but are not at the clinical cut-off for impairment.

Table 4.1 Descriptive data for maternal, parenting and child variables

	Mean (SD)		Mean (SD)
Maternal Variables		**Child Variables**	
Pain severity	2.3 (0.69)	Age	8.8 years (2.0)
Pain length	10.9 years (8.0)	CDI	53.58 (9.11)
Physical functioning	26.47 (12.93)	Child Health	4.82 (7.76)
Mental health	59.47 (7.75)	Internalizing	58.07 (11.57)
Problem-coping	19.83 (4.23)	Externalizing	54.29 (11.57)
Emotion-coping	11.30 (3.27)	Social Skills	3.33 (0.61)
Social support	3.81 (0.71)		

note: *n* (child) = 55; *n* (mother) = 39

Mean scores for parenting strategies employed by mothers with chronic pain and control mothers, with significant differences using t-tests for independent means are shown in Table 4.2. Mothers with chronic pain were significantly more lax [t (97) = 2.0, p<.05], indicative of permissiveness. They also experience a reduction in the quality of the relationship with their child [t (101) = -3.14, p < .05]. This supports the hypothesis that mothers with chronic pain display more negative parenting.

Table 4.2 Descriptive data and significant differences for parenting scales

Parenting		**Mean (SD)**
Laxness	Pain	2.58 (0.85)*
	Control	2.29 (0.57)
Verbosity	Pain	3.73 (0.83)
	Control	3.68 (0.68)
Overreactivity	Pain	3.01 (0.89)
	Control	2.78 (0.75)
Relationship Quality	Pain	14.09 (4.71)*
	Control	16.54 (3.25)

note: n (mother) = 39; * significantly different p < .05

Table 4.3 shows the correlations between child adjustment measures and maternal pain, and process variables. Physical functioning in the mother was significantly related to maternal reported externalizing [r = -.26, p < .05] and internalizing behaviour [r = -.24, p < .05], mother/child reported health difficulties [r = -.41, p < .05] and child reported depression[(r = .26, p < .05]. Social skills in children failed to be associated with any of the pain measures. This suggests that children's social functioning may be subject to other influences, and not the mother's physical functioning.

Table 4.3 Correlations between process variables and child outcome variables

		CDI	Health	Internal	External	Social
Pain Variables						
Physical functioning (PF)		-.26*	-.41**	-.24*	-.26*	.15
Process Variables	Maternal PF					
Mental health	-.30*	.24*	.32*	.50**	.29*	-.33*
Problem-coping	.06	.34*	.00	.28*	.16	-.15
Emotion-coping	-.23 t	.37**	.20	.47**	.32*	-.38**
Social support	.26*	-.17	-.33*	-.30*	-.26*	.41**
Parenting: Laxness	-.21 t	.17	.20	.44**	.28*	-.09
Parenting: Overreactivity	-.40**	.24*	.52**	.45**	.49**	-.18
Parenting: Verbosity	-.24 *	.22 t	.49**	.41**	.36**	-.33*
Relationship Quality	.28*	-.27*	-.25*	-.40**	-.24*	.58**
Child Variables						
Age	.07	.12	-.16	.17	.27*	-.04
Sex	.04	-.03	.29*	.08	.18	-.26 t

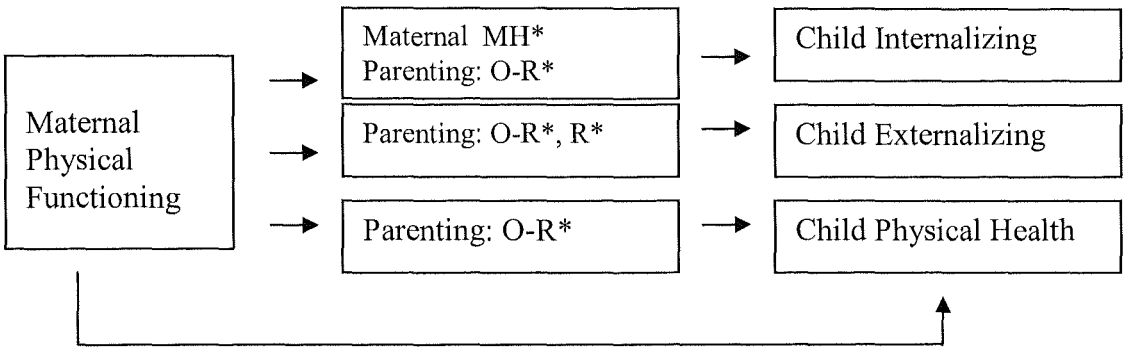
note:** $p < .01$; * $p < .05$; t $p < .10$

Physical functioning scores were significantly related to many of the psychosocial variables including mental health [$r = -.30$, $p < .05$], social support [$r = .26$, $p < .05$] and three of the parenting variables including over-reactivity [$r = -.40$, $p < .05$], verbosity [$r = -.24$, $p < .05$] and relationship quality [$r = .28$, $p < .05$]. Most of the psychosocial variables were related to child outcome measures. Decreased mental health and social support, increased problem- and emotion-focused coping, the use of dysfunctional parenting strategies and reduced supportive mother-child relationships, were associated with many of the measures of child-compromised adjustment. This supports hypothesis one and suggests that a range of maternal and family variables as well as maternal chronic pain are associated with child adjustment.

4.3.2 Tests of Mediation

To examine possible mediation links between maternal physical functioning and child outcome, Baron and Kenny's (1986) criteria were adopted, and analysed using the Sobel test for mediation (Preacher & Leonardell, 2003). Under these conditions, physical functioning must affect the given mediator, as well as the child adjustment measure in the absence of the mediator. The mediator must affect the child adjustment measure. The effect of physical functioning on the child adjustment measure must furthermore shrink upon the addition of the mediator in the model. As shown in Table 4.3, maternal mental health and three parenting variables, (overreactivity, verbosity and relationship quality) met Baron and Kenny's criteria to test for mediation. Children's social skills were not examined further, as there was no significant association with mother's physical functioning scores.

Figure 1 Sobel tests examining the mediators of the relationship between maternal physical functioning and child adjustment



Note: MH: Mental health; O-R: Over-reactivity; R: Relationship quality;* $p < .05$

Mediation was tested for the psychosocial variables that were significantly related to maternal physical functioning and child outcome measure. The results from the Sobel tests are presented in Figure 1. As predicted under hypothesis two, parenting variables emerged as a consistent mediator of the relationship between maternal physical functioning and the range of child adjustment measures. Mothers' over-reactivity emerged as a mediator for almost every form of child adjustment examined, and the quality of the mother-child relationship mediated for externalizing behaviour. Mother's mental health was also a significant mediator for children's internalizing behaviour [$z = 1.93, p < .05$]. Over-reactivity was a consistent mediator. This suggests that similar aspects of negative parenting are involved in the development of child problems (including internalizing, externalizing behaviour, and compromised physical health).

4.4 DISCUSSION

All hypotheses were supported. Under hypothesis one, a range of maternal and family variables (maternal mental health, coping, social support and parenting) were related to child functioning. Maternal mental health and the parenting variables of overreactivity, verbosity and relationship-quality were related to child reported depression, and physical health, as well as to maternal reported internalizing, externalizing and social behaviour. The strong relationship between parenting and child outcome was again reflected in the mediation analyses. Support for hypothesis 2 was shown by at least one parenting variable emerging as a mediator for child internalizing and externalizing behaviour, as well as for physical health. Supporting hypothesis 3, mothers with chronic pain were more likely to engage in dysfunctional parenting strategies, such as laxness, with a decrease in the quality of the relationship with their child.

Maternal physical functioning was significantly related to all child variables apart from social skills. This meant the exclusion of this child outcome in further mediation analyses. Although children in this sample were found to have significantly more social problems than controls (Evans, Keenan & Shipton, 2004), these may not have stemmed directly from the mother's physical functioning. Historically speaking, research indicates children's social development to be increasingly less sensitive to parental influences (Mullen, 1983). Parental factors are often poor predictors of children's social skills (Segrin, 1994). Therefore, external forces may have played a more substantial role. The influence of peers and external environments (such as school) may be more formative. Increased internalizing and externalizing behaviour associated with maternal chronic pain may have followed

children in their peer interactions, with maternal chronic pain leading indirectly to deficits in children's social skills.

Evidence for hypothesis two was strong. The proposed distal processes of mental health, social support and coping either failed to comply with the testing conditions, or failed to emerge as significant mediators in the relationship between maternal physical functioning and child functioning. Conversely, at least one parenting variable mediated this association for child internalizing, externalizing and physical health problems in children.

Maternal mental health also emerged as a mediator for children's internalizing behaviour. This was surprising considering the likely distal nature of maternal depression and psychological health (Goodman & Gotlieb, 1999). Children may directly imitate their mother's psychological distress in response to environmental stress. However, this direct link between maternal and child internalizing behaviour may subsume more complex relationships with closer mediators such as the child's own cognitive and coping skills (e.g., Goodman & Gotlieb, 1999).

In line with hypothesis two, parenting emerged as a foremost mediator. The quality of the mother-child relationship was a significant predictor of children's externalizing behaviour. Overreactivity was the most consistent variable to mediate the association between maternal physical functioning and child adjustment. Overreactive parenting explained children's externalizing, internalizing and health problems. Such dysfunctional parenting strategies have been linked to child problems before (Arnold et al., 1993). This reinforces the role that overly disciplinarian parenting plays in the development of children's behaviour problems.

The fact that overreactive parenting is important to both child internalizing and externalizing dysfunction suggests that this specific parenting strategy operates in a broad and extensive manner. Children are not only more likely to engage in

withdrawal behaviours in response to their mother's harsh demands, but they also retaliate by acting out and employing aggressive behaviour. Maternal overreactivity may provide a direct means for children to imitate antisocial and inappropriate responses to stressors. Children's externalizing behaviour may be influenced by authoritarian parenting through modelling of aggressive, insulting or frustrated behaviour (Baumrind, 1968).

Overreactive parenting also explained the relationship between compromised physical health in a parent and a child. The role of parenting in children's behaviour problems may be intuitive, but its function in children's physical health may be less so. There is some literature documenting the influence of parenting on the quality of children's physical health and health behaviour. Authoritative childrearing that fosters autonomy and the use of reason rather than punishment is associated with a range of positive health behaviours in children. In contrast, the use of more autocratic or authoritarian practices (such as overreactivity) is associated with less positive health behaviours, potentially leading to compromised health (Pratt, 1973).

An explanation for the role of overreactive parenting in children's health problems may lie in the notion of observational learning. Mothers with decreased physical adjustment who respond with overreactivity and emotionality may further escalate their physical health problems (Guthrie, 1996). They may, in turn, prove to be negative models for children's own learning of health behaviours. Modelling health behaviour is one of the most powerful methods for socializing children's health and health behaviours (Cullen et al., 2000). Children may observe their mother's health complaints and pain as expressed through overreactivity, and in turn adopt their own version of health problems and emotionality. Parenting style could also impact on children's health through the development of children's internalizing and externalizing problems- which may be more directly affected by dysfunctional

parenting. This concurrent development of physical and psychological difficulty is consistent with the overlap between mental and physical health (Turk & Flor, 1999).

Parenting clearly plays the most substantive role in determining how maternal chronic pain impacts negatively on children. Maternal behaviours such as reduced tolerance and a resort to punitive disciplinary practices, as a result of physical hardship, leads to children's behaviour and physical health problems. The lack of a warm and supportive mother-child relationship further explains the development of children's externalizing behaviour.

The parenting strategies found to be significant mediators were not the strategies found to be significantly different between control mothers and mothers with chronic pain. Mothers with chronic pain were more likely to report using laxness and developing a less warm relationship with their child. These mothers may be more prone to engaging in lax or permissive parenting, by withdrawing from the demands of chronic pain. Yet it is not 'giving in' to children that promotes negative outcomes. Rather, children seem to be especially sensitive to over-discipline when living with maternal chronic pain. Such strategies lead to a range of child adjustment problems.

The use of dysfunctional parenting strategies by mothers in chronic pain is not surprising considering the toll of chronic pain on an individual's emotional, physical and cognitive resources (Guthrie, 1996; Shipton, 1999). Dysfunctional methods that emerged as significant mediators required considerable energy demands on the part of the parent. Overreacting to situations and implementing harsh discipline divert crucial energy that a parent may need to get through the day's pain. Catastrophizing, in general, is linked to negative outcomes in chronic pain patients (Buer & Linton, 2002). Overreaction to child behaviour and the use of excessive punitive measures reflects an underlying tendency to view events and sensations in an exaggerated light in many patients, who do not deal with their pain effectively. Implementing parenting

education along with standard therapeutic strategies dealing with chronic pain, may prevent child maladjustment as well as allow parents to conserve their scarce resources.

The findings are consistent with work suggesting that parental chronic stressors may take many forms (such as depression, physical pain and martial hardship), yet their effects and mechanisms of dysfunction are remarkably uniform. Parental stressors have the potential to create risk for children, with negative parenting emerging as a primary explanatory variable (Downey & Coyne, 1990; Dubow et al., 1997; Kotchick et al., 1997). Dysfunctional parenting practices associated with parental stressors mean risk and negative developmental outcomes for children. On the other hand, positive parenting strategies contribute towards children's resilience in the face of parental stress (Dutra et al., 2000) Given the similarity seen here and in other maternal stress literatures, the question 'Is the particular manifestation of parental stress less important than the manifestation of parental stress itself?' inevitably arises. Risk for children may lie in the negative experiences and distress of parents, rather than in the particular form of parental mental or physical disability (Hirsch, Moos & Reischl, 1985).

The findings do not disregard the importance of other variables and processes in the relationship between maternal chronic pain and child functioning. Family, maternal and structural variables play a significant, albeit more distal role, in the relationship between maternal chronic pain and children's functioning. A more comprehensive analysis should explore whether these variables exert their influence through parenting variables.

A limitation of the present investigation is that only one set of proximal variables was examined. It is possible that a range of child variables, such as the child's own coping and social support may operate in the relationship. Steele,

Forehand and Armistead (1997) found avoidant coping strategies in children to play a role in the relationship between a parent's HIV severity and their children's internalizing problems. Further studies should address the possibility that differences exist between maternal and paternal chronic pain (Armistead et al., 1995), and the disparate roles that processes and mediators may play. The role that care-giving strategies employed by others (co-parents, fathers, family members) should be explored.

The present study illuminates the variables that impact on and explain the relationship between maternal chronic pain and child maladjustment. Yet, more research is needed to address the mechanisms involved in the relationship between parental chronic pain and children's psychosocial and physical functioning. Longitudinal studies with a large number of families are required to dissect the complex interplay of child and maternal variables in the path from maternal physical health to child outcomes. Attempts should incorporate developmental concepts such as feedback loops and the bi-directional reciprocation between maternal and child functioning (O'Connor, 2002). This can only be achieved by large-scale longitudinal work, which is required to understand and alleviate the suffering that many children living with maternal chronic pain experience.

The burden of chronic pain is substantial. It costs Western countries billions of dollars each year in work loss, health insurance and the use of doctors and the health care practices and services (James & Large, 1992; Lipton, Stewart & Scher, 2001). Chronic pain imposes suffering and heavy financial and emotional costs on affected individuals and their families. Children and other family members have only recently received the attention and concern their plight deserves. Not only should understanding and preventive efforts be made to minimise the patient's suffering, but

also for their children. Strategies to prevent and manage dysfunctional parenting practices benefit both parents with chronic pain, and their-oft forgotten children.

CHAPTER 5

GENERAL DISCUSSION

The aim of this dissertation was to provide insight into the physical and psychosocial functioning of children living with maternal chronic pain. To this end, a series of questions were posed that started with the source of potential risk, namely, mothers experiencing chronic pain. Their demands and their areas of compromised functioning were elucidated by comparison with healthy mothers. This provided a foundation for understanding the kinds of stressors or demands to which afflicted parents and children are exposed. The initial study demonstrated reduced functioning in mothers with chronic pain when compared to control mothers, and an associated risk for children. The next study offered an in depth analysis of children, and asked the most crucial question of all: - 'Would the psychosocial adjustment and physical health of young children in the risk group be compromised when compared to children of control mothers?' A number of supplementary questions were addressed as well. These included whether children's functioning was compromised to a level requiring clinical intervention, and whether sex differences existed. Although such questions help to identify the impact of maternal chronic pain on children, the question of '*how* children are adversely affected?' remains unanswered. What is it about maternal chronic pain that translates into suffering and hardship for children? In the third study, the overlap between maternal and child variables provided this point of departure. Parenting represented the most prominent signpost to explain the relationship between maternal chronic pain and the reduced child functioning seen in Study 2. The three empirical studies comprising the thesis addressed separate questions and provided valuable insights into each question. The studies also form an

integrated whole. This final chapter and discussion brings together the issues within each study, and forms a telling overview of children living with maternal chronic pain. Their context is understood, and their compromise explained.

5.1 Main Conclusions

The questions posed were addressed by three studies. The answers are provided in three separate, but related conclusions. *Firstly*, mothers experiencing chronic pain report increased dysfunction in a number of areas, including mental and physical health. There are a number of risks to children. These take the form of the mother's physical unavailability, her mental health issues, coping and support issues, and the reduced functionality of the family environment. Risk is present in the mother's reduced capacity to perform basic parenting tasks. *Secondly*, children display a vast range of dysfunctional behaviours when compared to children in the control group. These include increased internalizing and externalizing behaviour, compromised physical health and attachment issues. Many children are at risk of serious depressive symptomology. Boys appear to fare worse than girls. Such compromised behaviour is evident across multiple informants privy to children's behaviour in the home. *Thirdly*, dysfunctional parenting appears to be the primary explanation as to why children appear to suffer in the face of maternal chronic pain. Psychosocial variables such as mental health issues, social support and family environment are significantly associated with child outcomes. Yet, only parenting emerged as a significant mediator. The quality of the mother-child relationship as well as the use of over-reactive strategies (consistent with authoritarian parenting) determine how maternal chronic pain impacts adversely on children. Support that parenting is behind children's maladjustment was further shown by mothers with chronic pain engaging in dysfunctional parenting practices. Maternal chronic pain comprises a considerable

source of risk for children, on a par with other well documented forms of stress, such as maternal depression. The means to understand children's vulnerability lies in the proximity of the explanatory variable, with parenting representing the strongest connection between mother and child.

5.1.1 The Mother's Vulnerability

Psychosocial functioning plays an integral role in the individual's physical health. When compared to controls, mothers with chronic pain report a range of mental health problems, from increased depression and anxiety, to hostility and obsessive-compulsive tendencies. Most noteworthy in terms of their role as a parent, mothers with chronic pain are more likely to report difficulties in engaging in basic child-rearing tasks such as providing care, meals and transportation. Their use of maladaptive coping strategies is heightened, as is the level of family conflict and simultaneous reliance upon and reduction in social support.

Chronic pain and other forms of health difficulties are associated with decreased socioeconomic indicators, including income (Wagstaff & Doorslaer, 2000). Mothers in the chronic pain group report significantly less family income than controls. Disparities between the pain and control group are not simply a function of differences in income level, or in physical and mental health. Psychosocial differences including coping strategies and family conflict remain even after accounting for these variables. This is not to say that reduced income is not a significant stressor for families dealing with maternal chronic pain. It does not explain all of the variance, however, in the functioning of this group.

A vast precedent of biopsychosocial literature documents the association between physical health and psychological or social variables. Comparisons with controls, however, are rare. The examination of homogenous patient populations,

(such as mothers), and parenting in the context of chronic pain, is almost nonexistent. By addressing these oversights in the present dissertation, the unique demands of mothers with chronic pain are better understood. In line with the notion that the distress of each individual is shared by other family members (Rolland, 1988), the predicament of children is further understood. Children live with decreased support, conflict, and with their mother's depression, anxiety and other mental health issues. They live with their mother's reduced ability to engage in basic parenting tasks. As a result, they may be required to prematurely accept some of these roles and duties.

Future work needs to quantify the extent to which children see themselves as sharing in their mother's suffering. Children bear witness to transitions and distress in the family (Pryor & Rodgers, 2001). They seem to be aware of their mother's chronic pain and associated difficulties, and may share in the suffering of their parent. There is a need to explore the amount of their mother's pain and the associated compromise that children witness, and the relationship between this knowledge and their adjustment.

5.1.2 The Child's Vulnerability

When compared to control children of healthy pain-free mothers, children exposed to maternal chronic pain display a range of adjustment difficulties. Children report significantly elevated levels of depression, anxiety, physical health concerns, and insecure attachment. Mothers report that their children show significantly more internalizing, externalizing, social and health problems as well as decreased social skills. Fathers mostly report dysfunction consistent with the children's and the mother's reports. This consistency across reports indicates that children living with maternal chronic pain display a broad spectrum of dysfunction that is apparent to a number of different members of the family. Many of the children's internalizing

behaviours are exacerbated to the point of needing clinical intervention (i.e., above clinical cut-offs).

Teachers, on the whole, failed to report many differences between maternal chronic pain and control children. This may be due to children reserving their problem behaviour for home- the likely source of their stress. It may also be due to the difficulties detecting internalizing behaviour in children (Garber et al., 1991). Teachers were aware of some unhappiness in the children (in comparison to controls), but were not aware of the extent of their internalizing or depressive behaviour. Even still, teachers did report significantly higher levels of pain complaints. Children's compromised health, potentially underlying these complaints, has serious consequences for the future state of their health, and the development of their own pain complaints. These complaints could be on a par with those of their mothers.

Boys are most profoundly affected by maternal chronic pain. Boys report more aggression, anxiety (after adjusting for sex differences) as well as higher levels of insecure attachment. Their mothers report more attention and health problems and decreased social skills when compared to girls. These results are consistent with literature suggesting boys are at increased risk in situations of stress when compared to girls (Tronick & Weinberg, 2000; Werner & Smith, 2001). Boys need particular attention and intervention when dealing with their mother's chronic pain and suffering.

The parallels between children's vulnerability in the face of maternal chronic pain and their mother's vulnerability are striking. The mother's experience of physical and mental health is remarkably similar to their children. Yet objective characteristics of the mother's pain condition are generally not associated with child outcomes. In contrast, the mother's perceived physical functionality and mental health are more strongly related to children's functioning. The risk for children may

be less about their mother's physical condition and pain, but more about her response to the demands of the condition, and her perceived suffering or physical functioning (Korneluk & Lee, 1998). The adversity that maternal chronic pain means for children appears firmly embedded in the mother's psychological functioning.

5.1.3 Parenting: the interface of shared suffering

The interaction between a stressor and child functioning is not a simple cause and effect transaction (Goodman & Gotlieb, 1999). The relationship is, rather, characterized by a number of proximal mediating variables, that explain the association between the original distal source of stress and child outcomes. The strong relationship shown between mother and child adjustment offers a leading clue as to what provides the primary explanation of the relationship between maternal chronic pain and child maladjustment. Parenting is related to the mother's condition and suffering, and is close enough to the child to be relevant and meaningful to them both. A parent's strategy of care and discipline involves both mother and child. In accordance with the literature on maternal stress, parenting was identified as the most consistent and significant mediator of the relationship between maternal physical functioning and child adjustment. A negative mother-child relationship and the mother's use of over-reactive or authoritarian discipline strategies explained how the mother's compromised health affects children adversely. When compared to controls, mothers with chronic pain report an increase in the use of dysfunctional parenting behaviours. This suggests that the mother's resources may be taxed to the point that she experiences great difficulty in extending appropriate warmth and tolerance.

A number of other family, maternal and child variables may help to explain the impact of maternal chronic pain on children. Some of these were considered and analyzed in the present dissertation. For example, maternal mental health, social

support and coping were generally related to child functioning. Yet, parenting most clearly linked both mothers and children through its impact as a mediating variable. Factors such as interparental conflict and social support, although important to the mother's well-being, and indirectly to the children, may escape the child's attention (Pryor & Rodgers, 2001). However, even a very young child may be acutely aware of parental displays of anger or punitive disciplinary measures, and parental reticence to developing communication, support and warmth. The child may feel unloved or confused by such reactions.

The importance of the parent-child relationship to the child's security when facing chronic stress makes intuitive sense. The development of a warm and supportive relationship with a care-giver is pivotal for child adjustment (Masten, Best & Garmezy, 1990). It reflects a primal need for safety and security (Bowlby, 1957). In situations of stress or distress, children are more in need of a healthy relationship as at least one safe constant (Dutra et al., 2001). A dysfunctional relationship may leave the child even more vulnerable and more exposed to the original source of risk. Its impact may have long-term consequences.

The significance of a warm and supportive parent-child relationship shows a protracted developmental course (Masten & Coatsworth, 1998). The interpersonal skills that children learn early on are crucial in establishing relationships with others (including peers). These may follow the individual through to adulthood. This is illustrated through research showing that individuals less adept at forming relationships or experiencing one significant failed relationship, are more likely to go through further relationship transitions in future (DeGarmo & Forgatch, 1999). Another source of future interpersonal difficulty for children is the use of authoritarian strategies by parents. Overly harsh discipline and over-reaction plays a

strong role in the development of problem behaviour in children (Baumrind, 1978). This may affect ongoing peer relationships.

The maternal chronic stress-child outcome literature suggests that parenting, in the form of discipline strategies and the quality of the mother-child relationship, is a primary focal point for understanding the reasons why some children suffer adversity and others do not (Downey & Coyne, 1990; Dutra et al., 2000). Consistent with this literature, the use of dysfunctional parenting strategies also sheds light on why children suffer as a result of maternal chronic pain.

The relationship between maternal chronic pain and child adjustment is more complex than any single variable can explain. It is unfair to suggest that sole responsibility and fault lies with the parent when a child may display maladjustment in the presence of parental chronic pain. In line with developmental principles, parenting interactions represent a two-way process. Parenting is a relationship, and implies bidirectional influences between parent and child. Parents affect children but children's nature and qualities affect parents as well (O'Connor, 2002). An important question yet to be answered in the context of chronic pain is:- 'What impact do children have on parents and their use of parenting practices?' A child with a difficult temperament may thwart even the best intentions of a parent to foster warmth, or be forgiving of mistakes or lapses in their child's good behaviour (Pryor & Rodgers, 2001).

Future research should address the impact of children on mothers with chronic pain. Certain kinds of relationships and positive mother-child interactions may reduce the mother's experience of pain and suffering. Such a transactional model is complex to test, but captures the level of depth required to fill the gaps in insight. Another area to examine is the unfolding of triadic (or simultaneous) interactions, between *both* parents and the child. Coparenting, that is, how parents relate to each other in

their roles as parents, may provide special insights when understanding child outcomes in the presence of parental stress (McHale, 1997). An understanding may exist between parents that the healthy partner takes on the tasks that the sick parent finds difficult or tedious. This may, in turn, reduce the negative impact of the condition on children.

5.2 Limitations and Strengths

5.2.1 Limitations

As with most studies, there are limitations with the present research. The presence of the father or co-parent was confined to Study 2, where fathers provided a report of the children's behaviour. It may have been worthwhile to explore the impact of the father's parenting style along with the mother's in the mediation analysis. The father-child relationship may provide a much richer and complete understanding of the manner in which maternal chronic pain affects children. A warm and supportive father-child relationship could mitigate a compromised mother-child relationship.

With regards to the sample, some limitations are evident. Although larger than previous samples, the sample size was relatively limited. This was due to the range of problems associated with recruiting chronic pain patients. These include sufferers' decreased mobility, and reduced energy and motivation to engage in tasks that are not directly related to getting through the day. Filling out questionnaires for arthritis sufferers may not be possible, or at the least, incredibly painful. Parents with chronic pain have even more difficulties to deal with. The long-term benefits of sharing their experiences through study participation may seem far removed from the sufferer's immediate- and short-term demands, such as trying to prepare the evening meal. Answering an advertisement that takes valuable time and energy away from these basic tasks may seem an unwarranted luxury. Despite the recruiting challenges

facing the chronic pain researcher, future work requires larger sample sizes to allow for more complex analyses.

The fact that mothers in the chronic pain group selected themselves for inclusion is another limitation. Exaggeration or fabrication of symptoms may have occurred due to attention-seeking or the offer of a monetary reward for their involvement. Although participants were screened over the telephone, it is possible that the sample was comprised of some individuals who did not meet the definition of chronic pain. All of the analyses were based on mothers' reports of their physical health, with no subsidiary or cross-informant reports for verification (e.g., doctor's reports). As pain is a subjective experience, with individual thresholds varying, this makes the determination of pain severity difficult to establish (Fordyce, 1994). Individuals report on their own level of pain. A medical examination or the use of medical records could indicate the participant's type of pain, yet undetected malingering or an incomplete understanding of the pain severity is theoretically still possible.

Somatically-focused mothers with illness behaviour may have responded to the advertisements. Some pain conditions associated with increased health-seeking behaviour may have been represented above others. Due to the limited nature of the epidemiological chronic pain research in New Zealand, it is impossible to determine whether mothers seeking medical attention and medication were overrepresented in this sample.

The studies were all cross-sectional, precluding some conclusions regarding causal influences. Longitudinal research is required to understand the cause and effect transactions. The focus of this thesis has been on maternal chronic pain affecting child functioning. Yet the relationship is probably far more complex than a simple transaction, with the child's adjustment and other characteristics interacting

with and feeding back into the mother's experience of pain. Chronic pain under a biopsychosocial definition involves the intersection of many different variables, whether they be physical, psychological or social. How other family members react to the mother's condition may conceivably alleviate or exacerbate her pain, and suffering. An angry or hostile partner or child may increase the mother's own anger, hostility and pain. Nevertheless, chronic pain is still likely to represent the primary source of stress.

The lack of a longitudinal analysis prevents extrapolation regarding the child's long-term adjustment. Children in the maternal chronic pain group clearly displayed disadvantages across a broad spectrum of adjustment measures. But their functioning may not remain compromised indefinitely. The stress of maternal chronic pain and the associated family problems may ultimately be relatively short-term, with children recovering and adapting quite well later on. Once children reach normative developmental turning points, such as puberty and high school, and gain a certain level of independence, the stress associated with their parent's pain may no longer remain a pressing force in their lives. It is unknown whether children who are adversely affected by maternal chronic pain continue to remain so. Hints from the literature regarding the effects of general parental stress and distress on children's adjustment suggest at least mid term deleterious consequences for many children (Masten & Coatsworth, 1998).

5.2.2 Strengths

The primary strength of the present dissertation is its emphasis on the individual within the context of the functioning of those around them. In line with developmental theories, the adjustment of the mother and the child are highly connected. The effects of maternal chronic pain are explored from origin, or the

functioning and demands of the mother, through to its impact on children. The discourse concludes by connecting the pieces and elucidating the mechanisms that tie mothers' and children's' functioning.

Another aspect of the developmental focus was that children's ages are narrowed to a relatively small range. Some studies have included children from 5 to 18 years. But in the present dissertation it was recognised that such a wide range could hide developmental differences. Although the functioning of adolescent children in the face of maternal chronic pain is relatively unknown, and needs to be examined in the future, the predicament of younger children is now more clearly understood.

An important strength is the inclusion of a wide range of child adjustment variables. The risk principle of multi-finality means that a particular stress factor can lead to a number of distinct outcomes (Cicchetti & Toth, 1998). By examining different aspects of children's behaviour (including internalizing, externalizing, social skills, attachment and physical health), credit is given to this concept. Children's adaptation to maternal chronic pain is more richly and completely understood. Another key asset is that a number of informants, including the children themselves, reported on behaviour. Bias associated with a certain kind of informant is reduced. It also gives a number of family members and teachers the chance to contribute their views and observations. Furthermore, the validation of the research tools used allows for firm and confident conclusions.

Another strength of the present research is the use of a larger sample size than has been used previously. Whereas previous research in the area found inconsistent results, the larger sample size here detected effects, and revealed the nature of the negative impact of maternal chronic pain on children. The wide range of chronic pain conditions included in the sample allows the extrapolation of these results to many

forms of maternal chronic pain. The consistency with other forms of parental illness, such as HIV, suggests that these findings are relevant to parental physical illness and pain in general. More work is needed to validate if this is the case, especially with reference to fathers with chronic pain. The consistency and gravity of the findings, however, indicate that parental physical debilitation comprises a major risk factor in the lives of young children.

Given the depth and span of the research, the central purpose of understanding the functioning of children facing maternal chronic pain was well served. The predicament of certain children (adolescents) living with parental chronic pain, especially those whose fathers suffer from chronic pain, may still remain part guesswork, and part anecdote. The plight of at least young children of mothers with chronic pain is now more clearly understood. The range of children's negative outcomes has been elucidated, as have the underlying psychosocial mechanisms that lead from negative functioning in the mother to the child. Although the research is not without its flaws, the design and findings offered here provide a level of insight into the plight of children living with maternal chronic pain that has not been attained in the literature thus far.

The findings clearly indicate that maternal chronic pain represents a source of risk for children. Its effects are pervasive and sobering. Given the protracted nature of chronic pain in parents, it is likely that the source of risk and its accompanying negative effects on children, become persistent.

5.3 Practical Implications

Does this research have any implications for improving the lives of families facing parental chronic pain? Using this new knowledge about the factors that represent differences in the families of mothers with chronic pain and healthy control mothers,

interventions could be targeted to strengthen psychosocial factors, where inadequacies are revealed. Where an assessment reveals that social support for the affected parent is lacking, interventions should be targeted at increasing social support. This can be achieved via support groups, and by training in how to identify and access sources of support. Coping, appraisal, and other psychological processes such as mental health explain much of why some people deal with stress and physical health issues effectively whilst others do not (Hemenover & Dienstbier, 1998). Therapy targeting the individual's cognitions on these issues becomes an important component of intervention.

Parents with chronic pain need assistance when it comes to day-to-day parenting tasks, and the use of effective and fair discipline strategies. Interventions aimed at parenting skills may not only assist parents, but children as well, by interrupting the path from parental chronic pain to child adversity. Such interventions should focus on helping parents with the range of parenting tasks and strategies known to be affected. This might take the form of programmes that can easily be accessed by parents, and that provide them with sources of support. Methods of dealing with difficult children while physically debilitated, including issues of safety, relief from parenting duties through supervised childcare, or assisted day trips, could all help to mitigate parental limitations. Simple interventions providing the parent with relief from mundane household tasks and enabling them to spend 'quality' time with their children may also be valuable. Interventions might be as basic as rearranging various aspects of parents' lives to best utilize their resources. The development of flexible working hours, allowing parents to arrange their schedules according to child care and their own care, or arranging employment from home, are two simple changes that promote more adaptive ways of coping with pain and the tasks of parenting. Although such interventions go above and beyond usual

therapeutic practices for chronic pain sufferers, they are necessary measures if the detrimental effects of maternal chronic pain are to be prevented for both mothers and children.

Intervention would require a substantial monetary commitment and the availability of trained professionals. Developmental science can point to the kinds of factors that are important in designing interventions to enhance the development of children where the parent's chronic pain leads to a less than optimal environment. Paying for such interventions, however, is another matter entirely. Implementing interventions improving the circumstances of parents and children requires a willingness on the part of governments or local bodies to provide the necessary financial resources. The costs imposed on society may appear substantial, especially in times of uncertain economic outlook. The long-term benefits may well be cost effective for society, as well as for the individual and families affected by chronic pain.

The use of longitudinal methods is a particularly valuable future contribution that could be made by developmental psychologists. This will determine the following,:- long-term effects for the well-being of children living with parental chronic pain; whether the effects change with the child's age; and whether there are 'sleeper' effects that only emerge after the initial casual factors have ceased to operate. However, the task of producing realistic analyses of the potential costs and benefits of state-funded interventions cannot take place without a thorough, long-term examination of the relationships between parental chronic pain and children's psychological development.

Owing to a lack of knowledge about the development of the problems many children of parents experiencing chronic pain are likely to face, intervention efforts at this stage are likely to be either premature or misplaced. Effective intervention can

only be based on a firm understanding of real problems as identified through high-quality research (Chilman, 1988). Further knowledge of the precise outcomes that children of parents with chronic pain experience, and the complex mechanisms that generate such outcomes, is first needed. Then interventions can look at promoting the psychological and physical health of this increasingly large group of parents and children.

5.4 In Conclusion

The cost of chronic pain to society is heavy indeed. In financial terms alone, the world-wide strain on business and health-care resources translates into billions of dollars in lost time, insurance and the use of medical resources (Lipton, Stewart & Scher, 2001).

The cost of chronic pain to the suffering individual represents a far more pervasive and malignant cost. Afflicted individuals must adapt to physical disability and its associated financial strains, resulting from health costs or the loss of work. Difficulties may also affect sufferers in a very personal way. Associated mental health issues, such as depression and anxiety, are common. Strains in relationships are frequent as others adapt to and take on board the individual's reduced duties and increased expectations of support. These personal difficulties may exacerbate the pain of the sufferer.

Suffering and pain are not privately owned or endured by the afflicted individual. The family and those in the immediate social environment take part in much of the chronic pain patient's predicament. Young children are the most likely to become immersed in the hardship that radiates from their parent's pain. This involvement may not be voluntary, or even conscious. While the partner and other adults in the family may feel the pressure of the sufferer's pain in their own lives, they

are not trapped in a reactive and dependent role as children often are. As this research has demonstrated, the stress of maternal chronic pain is endured and suffered to a significant degree by the children. Since these issues have been largely ignored until now, such children may have suffered alone. This is the first time that such a large scale exploration of the plight of children of sufferers has been undertaken. Considering the extent of the consequences revealed here, the experiences of the child facing parental chronic pain should motivate the development of a major research interest.

Chronic pain is a burden that is shared between the individual, the family, and the immediate and wider society. The present research demonstrates that mothers with chronic pain struggle with a number of demands, not the least of which is their role as a parent. It further suggests that children's adjustment and development is intimately connected with their mother's own suffering and adjustment. The tie binding each to the psychosocial health and pain of the other is the quality of the relationship.

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APPENDIX A1

Consent From Human Ethics Committee

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UNIVERSITY OF CANTERBURY
CHRISTCHURCH · NEW ZEALAND

26 February 2001

Subhadra White
C/o Thomas Keenan
Department of Psychology
UNIVERSITY OF CANTERBURY

Dear Subhadra

The Human Ethics Committee advises that your research proposal **"Maternal Chronic Illness: what does it means for the child?"** has been considered and approved.

Yours sincerely

Isobel S Phillips
Secretary

APPENDIX A2

Questionnaires designed for the dissertation

Background information Questionnaire

1. Please list your children's ages, sex and year of birth:

	Age	Sex	Year of Birth
Child #1	__	__	19
Child #2	__	__	19
Child #3	__	__	19
Child #4	__	__	19
Child #5	__	__	19

2. Are you the: 1. mother 2. father 3. stepmother 4. stepfather

3. Your age: ___ years

4. Which ethnic group(s) do you belong to (e.g, Maori, Pakeha, etc.) _____

5. Please indicate the chronic condition(s) you are diagnosed with:_____

6. Please indicate the year you were diagnosed with your condition: _____

7. How many years have you been affected by your condition:_____

8. Presently, which of your symptoms bother you the most? Please list.

_____

_____

9. Generally speaking, how severe are the symptoms of your condition?:

1. mild _____ 2. moderate _____ 3. severe _____

10. Generally speaking, how severe is your pain?

1. mild _____ 2. moderate _____ 3. severe _____

11. How often do you experience pain (please circle one)?

1. Monthly 2. Fortnightly 3.Weekly . 4. Two to three times/week...5. Every day

12. Do you feel that the medical profession has been able to adequately determine the cause or origin of your pain?

1. Yes 2. No

13. Please list all of the medications you are taking for your chronic condition.

_____

14. List any other medications you are taking on a regular basis and why.

_____

15. Your marital status is: (circle one please)

Single.....1 Married.....2 Divorced/separated.....3 Widowed.....4

16. In regards to employment, you are: (circle one please)

Employed.....1
Not employed by choice.....2
Cannot find employment.....3
Retired.....4
Homemaker.....5

17a. What is the highest grade you completed in school? (circle one please)

Postgraduate degree (M.A.; M.S.; PhD;).....1
Bachelors degree (B.A.; B.S.) 2
Other tertiary.....3
Polytech diploma/certificate 4
Bursary/Higher school certificate 5
School certificate 6
Some High school.....7
No formal education 8

17b. What is the highest grade your spouse completed in school? (circle one please)

Postgraduate degree (M.A.; M.S.; PhD;).....1
Bachelors degree (B.A.; B.S.) 2
Other tertiary.....3
Polytech diploma/certificate 4
Bursary/Higher School certificate 5
School certificate 6
Some High School 7
No formal education 8

18. What was your household's total income before taxes in the last year? Please include income from wages, income support, interest, dividends, contributions from family or other household members.

Less than $5000.....1
Between $5000and$9999.....2
Between $10,000 and $14,999...3
Between $15,000 and $19,999...4
Between $20,000 and $29,999...5
Between $30,000 and $49,999 6
Between $50,000 and $69,999 7
Between $70,000 and $99,999 8
$100,000 or more..... 9
Don't know..... 10

Child Health Scale- Mother Report

The following questions are about your child's health. Please answer all questions by placing a tick in the appropriate box or completing the answer that most applies to your child's *general* behavior.

SLEEPING PATTERNS

	2-3 times/ night	Once per night	Once a week	Once a month	Never
1. How often does your child wake up during the night?					
2. How often does your child have bad dreams or nightmares?					
3. How often does your child co-sleep with you/ another family member?					
4. How often does your child sleepwalk?					

5. Did your child have sleep disturbance problems as an infant?

Yes No

EATING PATTERNS

	2-3 times per day	Once per day	2-3 times/ week	Once a month	Never
6. How often does your child say he or she is not hungry at meal times?					
7. How often is your child's school lunch mostly uneaten?					
8. How often does your child overeat?					

GENERAL HEALTH

9. **Does your child currently suffer from any medical conditions** (e.g., migraine, asthma, allergies, diabetes, etc)?

Yes No

If yes, please list _____

_____

10. Does your child currently take medication?

Yes **No**

If yes, please list the name of medication(s) and how often your child takes the medication(s)

_____

	Daily	Once a week	Once a month	2-3 times/ year	Once a year	Never
11. How often does your child suffer from colds, flues or infections?						
12. How often does your child suffer from stomachaches?						
13. How often does your child suffer from headaches?						
14. How often does your child have accidents or injuries?						
15. How often does your child visit the doctor?						
16. How often does your child complain about pain that cannot be explained by a medical cause or injury?						

17. Where does your child usually experience pain?

Please list _____

18. On a scale of 1 to 5, how healthy do you consider your child to be (1 = *good health*; 5 =*ill health*) compared to other children?

1	2	3	4	5
good health				ill health

Child Health Scale- Child Report

SLEEPING PATTERNS

	2-3 times per night	Once per night	Once a week	Once a month	Never
1. How often do you wake up at night?					
2. How often do you have bad dreams or nightmares?					
3. How often do you hop into mum or dad's (or siblings) bed to sleep at night?					
4. How often do you sleepwalk?					

EATING PATTERNS

	2-3 times per day	Once per day	2-3 times/ week	Once a month	Never
5. How often do you <u>not</u> feel hungry at meal times?					
6. How often do you not feel like eating lunch at school?					
7. How often do you feel like you could keep eating and eating and still not feel full?					

GENERAL HEALTH

8. How often do you feel sick or sore somewhere in your body?

Everyday Every week Every month Every year Never

9. Where do you hurt when you feel sick or sore?

_____

ILLNESS BEHAVIOUR

10. How often do you think you go the doctor?

Every day (4) Once a week Once a month Once a year Never (0)

11. How many times do you go to the sickbay at school?

Every day Once a week Once a month Once a year Never

Child Health Scale- Teacher Report

1. How many times has the child been absent from school in the last six months?

_____

2. How many days absent were due to health related issues (e.g., sickness, doctor's visits, etc.)

_____

3. How often does the child complain about illness or pain he/she experiences? (Please circle one).

Never...0 not often...1 sometimes...2 often...3 always...4

4. How often does the child visit the sickbay or school nurse during school time? (Please circle one).

Never...0 not often...1 sometimes...2 often...3 always...4